Our Future Health: a unique global resource for discovery and translational research

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Our Future Health inception and vision

Our Future Health, a new prospective cohort in the United Kingdom, has a mission to help people live longer, healthier lives through the discovery and testing of more effective approaches to prevention, earlier detection, and treatment of diseases. Our Future Health is a charity supported by the UK government, industry and medical charities which aims to recruit 5 million volunteers from the UK adult population in order to create a unique resource which will catalyse aetiological and translational research for both common and rare diseases.

Healthcare systems across the world are facing an increasing burden of chronic diseases due to ageing populations with most conditions currently only being detected at an advanced stage when they are much more difficult to treat effectively. Recognising this, initial discussions exploring the need for a new very large cohort to address these public health challenges began in 2016 with several medical research charities, UK Research and Innovation (UKRI), and leading public health practitioners and academics. The proposal to establish a 5-million participant cohort which would combine health and other data to accelerate the development of preventative strategies, with earlier detection and diagnosis enabling earlier and more effective treatments to be developed was set out in the Accelerating Detection of Disease challenge of the government's Industrial Strategy Challenge Fund (ISCF). In 2019 an investment of £79 million was allocated from the ISCF by UKRI to establish Our Future Health, with over £180 million in conditional matched funding from industry and charity partners being secured since then.

Our Future Health in the UK research landscape

Our Future Heath builds on and complements the wider genetic and disease research infrastructure of the UK, particularly the major successes of UK Biobank[1] Genomics England[a], and the National Institute for Health and Care Research (NIHR) Be Part of Research[b] and BioResource[c]. UK Biobank continues to facilitate a broad array of aetiological research as well as providing translational insights. Genomics England's flagship 100,000 Genomes Project is delivering important discoveries in cancer and rare disease genetics. NIHR Be Part of Research and BioResource have successfully supported recruitment to thousands of studies across the UK, bringing together participants and researchers. Our Future Health, meanwhile, will provide several unique opportunities. The unrivalled large size of Our Future Heath will enable precision prospective studies of common and rarer diseases: how they develop, how we can intervene, how we can treat. The access to biological samples in our large prospective cohort will facilitate translational discoveries by enabling specific deep phenotyping of selected populations. Recontact studies will enable selection of participants based on geography, demographics, genetics, phenotype, and disease risk to be invited to consent to additional research studies and trials, catalysing translational research.

The age, ethnic, and geographic diversity of the cohort will facilitate extrapolation of findings to all communities, providing the largest multi-ethnic cohort, the largest cohort of young people (18–40 years), largest working age populations, and the largest cohort of over 60s in the world. These features will provide subpopulations, mechanistic interactions, and pre-diagnostic biospecimens to be studied in a level of detail not possible before. Our Future Health will be a learning system for the reframing of health care towards prevention, that can ultimately feed into longitudinal personalised health programmes[d,e]. Planned serial enhancements in sequential surveys, expanded data linkages, and -omic analyses will add additional depth in phenotyping, further expanding opportunities for research. We will facilitate an analytic environment amenable to machine learning and artificial intelligence-based models to ensure we optimise insights and discoveries.

Other programmes in the UK research landscape that have less phenotypic and geographic breadth but are also complementary programmes that serve somewhat different purposes include, The Scottish Health Research Register and Biobank[f], and Healthwise Wales[g]. There are also other cohort studies such as European Prospective Investigation of Cancer and Nutrition (EPIC)[2], Generation Scotland[3], Genes & Health[4], Growing Up in Wales[5], Million Women Study[6], Northern Ireland Cohort for the Longitudinal Study of Ageing[7], and the new MRC's Adolescent Health Study[h], amongst many others. This rich tapestry provides for a diversity of needs that no single programme can provide.

[a] https://www.genomicsengland.co.uk/
[b] https://bepartofresearch.nihr.ac.uk/
[c] https://bioresource.nihr.ac.uk/
[d] https://www.gov.uk/government/publications/nhs-health-check-programme-review
[e] https://www.gov.uk/government/publications/making-prevention-everyones-business
[f] https://www.registerforshare.org/
[g] https://www.healthwisewales.org/
[h] https://www.ukri.org/what-we-do/browse-our-areas-of-investment-and-support/adolescent-health-study/

Progress to Date

Following the establishment of Our Future Health in 2019, an Ethics and Feedback Advisory Group developed the Ethics and Governance Framework. Over the next year Our Future Health conducted extensive Patient and Public Involvement and Engagement (PPIE) work to ensure that the programme, consent, and participant information materials were co-designed with the public prior to the first recruitment pilots (with NHSBT and NIHR BioResource) which started in 2021. The protocol and all participant materials were reviewed and approved by the East of England – Cambridge East Research Ethics Committee, overseen by the Health Research Authority and are available at https://ourfuturehealth.org.uk/get-involved/researchers/ .

Following an innovative community pharmacy-based pilot, Our Future Health began full study recruitment in October 2022 with the programme open to all adult residents of the UK. Before opening a new recruitment centre, we send an invitation letter to every individual/household in a defined geographical area (typically a 5-mile radius) using a mix of NHS DigiTrials[i] and non-personalised letters, but individuals do not have to receive a letter to become a participant. Individuals read the participant information sheet and consent online to become a participant. Consent includes linkage to health-related records, and we are initially linking to secondary care, cancer and death registration datasets (and primary care in Scotland and Wales). Participants then complete the baseline questionnaire online and book an in-person appointment for physical measurements and donation of blood samples. Appointments have been made available in a mix of venues including shopping centres, mobile units in supermarket car parks, in community pharmacies and through the NHS Blood and Transplant Service with over 200 locations provided to date in England. Recruitment is commencing in Scotland and Wales in 2024, and in Northern Ireland in 2025. Extracted DNA is genotyped on a custom Illumina genome-wide array, and plasma, buffy coat and DNA are stored long-term in automated −80°C freezers at UK Biocentre.

By September 2024, less than 2 years after launching recruitment, over 1.8 million volunteers have consented to join Our Future Health, with over 1.3 million completing the questionnaire and over 1 million having donated a blood specimen, making Our Future Health the largest consented cohort study with biobanked blood samples in the world

We are also making data available to researchers at an unprecedented pace with ~1 million participant questionnaires, 330K participant genotypes and 650K participant linked NHS data now available to researchers in the Our Future Health Trusted Research Environment following an approved application by our independent Access Board. In 2025, Our Future Health will open for applications to access the biobanked biological samples, as well as for recontact studies including clinical trials.

Aetiological and Translational Research

Our Future Health participants reflect the diversity of the UK adult population in terms of age, sex, ethnicity, index of multiple deprivation, and geography, and we will provide statistical weights for

[i] https://digital.nhs.uk/services/nhs-digitrials

the UK census 2021/22 population—our sample frame. We will continuously monitor our success in reflecting population diversity, making strategic decisions to maximise representation.

The unprecedented scale and diversity of the Our Future Health cohort will enable researchers to study rarer diseases and/or smaller study populations (for example, by age/ethnicity/phenotype) in a single programme, avoiding problems of consortium analyses and facilitating research into health inequalities. Access to subpopulations is particularly important when assessing biological specimens in nested case-control or case-cohort studies, catalysing discovery and validation of biomarkers for purposes of risk prediction, diagnosis, and prognosis.

Some recontact study designs will require return of personal disease risk information to participants – including genomic data – necessitating the co-design of approaches that are acceptable, ethical, do not cause any undue anxiety, and can be accommodated within the National Health Service (NHS). Our recontact study framework is currently in development and is being informed by extensive stakeholder engagement including the public, our participants, scientists, and the NHS via our Implementation Board. These studies will provide an evidence-base for the benefits and challenges of returning such information to participants, enabling a greater focus in UK healthcare on disease prevention.

Our Future Health is open for research now. For more details and to make an application to our independent Access Board, please visit https://research.ourfuturehealth.org.uk/ and help us in our mission to help people live longer, healthier lives through enabling research, discovery and testing of more effective approaches to the prevention, earlier detection, and treatment of diseases.

Figure 1. Graph representing the geographic locations of the 1.75 million consented participants of Our Future Health as of 6th August 2024[1]



[1] Recruitment is commencing in Scotland and Wales in 2024, and in Northern Ireland in 2025.

References

1. Sudlow C, Gallacher J, Allen N, et al. UK biobank: an open access resource for identifying the causes of a wide range of complex diseases of middle and old age. *PLoS Med* 2015; **12**(3): e1001779.

Authors' Contributions

Conceptualisation: All
Funding acquisition: All
Writing – original draft: MBC
Writing – review & editing: All

Conflict of Interest Statements

None

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We received initial funding of £79 million from UK Research and Innovation – the UK Government-funded body that invests in science and research. This funding has been used to begin to deliver the programme.
The Government's 2023 Autumn Statement announced an extra £51 million of new funding, to be delivered through UK Research and Innovation.
In addition, we have raised £180 million from leading life sciences companies and health research charities, who are investing in and providing their expertise to support the design and delivery of our programme.
Read more about the collaborations that support Our Future Health.

Ethics Committee approval

Our Future Health received a favourable opinion by the East of England - Cambridge East Research Ethics Committee (REC reference: 21/EE/0016, https://www.hra.nhs.uk/planning-and-improving-research/application-summaries/research-summaries/our-future-health/) on 29th March 2021 for a period of 5 years.