In the news

From The Times and the Telegraph to your local paper, we’re always making news!

The Sunday Times highlighted ‘smug beanpoles’ who might be hiding extra layers of fat. Swedish company AMRA Medical works with UK Biobank to analyse abdominal fat from scanned participants.

Follow our progress

UK Biobank is a project ahead of its time, and only now are others around the world catching up. So says Jeremy Farrar, Director of Wellcome, one of our major funders. “Things we are talking about today would have been unimaginable in 2006 when UK Biobank started,” he told our annual scientific conference in June “and the pace of change is getting ever faster.” You can find out much more about the conference, study the latest approved research and published findings and catch up on all the other news on our website: www.ukbiobank.ac.uk

Did you know?

UK Biobank is part of the government’s long-term strategy to make the UK the best place in the world for science and business. This has resulted in the UK Biobank receiving a grant of £30 million from the government-funded MRC to analyse the genes of 50,000 participants in the most detail possible.

Artificial intelligence

Can computers use the huge volumes of UK Biobank imaging data to be ‘taught’ how to analyse complex health scans? Most likely, say researchers doing just that. Will computers take jobs from front-line health specialists like hospital radiologists? Probably not, but radiologists of the future will need to be experts in artificial intelligence. They found that the amount of abdominal fat in similarly shaped people with the same BMI or waist measures could vary by several litres. The knowledge will help scientists better understand the role of fat in causing diseases like diabetes and may serve to identify people unknowingly at greater risk.

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Unlocking health secrets

It is difficult to over-estimate the importance of genetic research in advancing 21st century healthcare. A revolution in understanding our genes, that underpin all biological metabolism, is under way. But genetic research is complex and expensive.

Such is the size and scale of UK Biobank, that we have been able to take giant steps to unlock more genetic secrets of human health – and we have made genetic information available to more researchers than ever before.

We are able to speed up the research process, reduce costs and waste and ensure quality. (Not to mention, allow scientists who have never thought to use genetic data, the ability to do so cheaply and easily.) UK Biobank has two multi-million pound genetics initiatives under way, and a third is already complete.

Loneliness

You may remember we asked you lots of questions about your health and well-being when you joined UK Biobank. All that information has been put to good use. Researchers in Cambridge looked at the answers to questions about loneliness, and found that it may be influenced by our genes. Further analyses looked into specific activities like going to the pub, or a sports club or gym. It revealed fine-grained genetic differences, but also similarities for choosing a particular activity.

April 2018

A major initiative to sequence the full genomes of 50,000 UK Biobank participants gets under way. Funded by a £30M grant from the Medical Research Council (MRC), the work is being done at the Wellcome Sanger Institute, Cambridge, a world-leader in genome research. Funding to sequence the 450,000 other samples is being sought.

January 2018

A new collaboration of leading life-sciences companies, led by Regeneron (and with GSK at first), agreed to sequence the exomes of all half million UK Biobank participants. Exome is a small but special part of our genetic make-up. It makes proteins, and is likely to be important in drug development.

March 2013

Plans to identify hundreds and thousands of known points of interest on the genes of all 500,000 participants are announced. The data were made available to approved researchers in 2015.
Headache
Information from 225,000 UK Biobank participants has shown that headache is mainly driven by neurological changes in the brain, rather than changes in blood supply, as was previously thought. The researchers also found that headaches and conditions like depression share common genetic components, which may explain why many migraine patients also suffer from depression. The work also identified 14 new genetic areas of interest for headache.

Depression
International collaborations using UK Biobank data strengthen research and lead to exciting new findings. A 200-strong team of researchers from across the globe incorporated UK Biobank data to map in unprecedented detail the genetic differences that increase the risk of depression. In the world’s largest investigation of its kind, researchers identified 44 gene variants that raise the risk of depression (including 30 new ones). Researchers pooled data from studies in the UK, US, Iceland and Denmark.

Osteoarthritis
In the largest study of its kind, nine new genes for osteoarthritis have been discovered. This could open the door to new treatments that target a genetic abnormality. The team used UK Biobank to study millions of gene changes in more than 30,000 people with osteoarthritis and nearly 300,000 people without.

High quality activity data
103,000 UK Biobank participants wore a watch-like device to record their activity for a week. This provided information about mobility, lack of movement and periods of sleep. It is “extremely high quality data,” said one of the researchers leading the project to make it available to other researchers. “It is unbelievable.”

The data are already being used in studies. One research group reports that a single minute of exercise each day is linked to better bone health in women. Those who did “brief bursts” of high-intensity, weight-bearing activity equivalent to a medium-paced run for pre-menopausal women, or a slow jog for post-menopausal women, had better bone health. The researchers found that women who on average did 60-120 seconds of high-intensity, weight-bearing activity per day had 4% better bone health than those who did less than a minute.

Stay in touch
It’s really important we have your up to date contact details for you. Please use the enclosed flyer to provide your current email address, home address and telephone numbers, if they have changed.
The Eyes Have It

Such was the success of UK Biobank recruitment all those years ago, that in the last phase we received extra money to take detailed eye measurements. This visionary decision has created a rich and exciting seam of data that has an impact not just on eye health - but many other disorders as well.

Could routine eye tests be a cheap, quick and simple way to identify diseases like dementia earlier? Researchers certainly think so, and hope such tests will become commonplace in the near future. Eye examination can identify risk of stroke, heart attack, hypertension, dementia and other health problems. Now, UK Biobank data have shown that thinning of the retinal nerve fibre layer (RNFL) is linked to cognitive decline.

Glaucoma is the world’s leading cause of incurable blindness. It affects more than 500,000 people in the UK and millions worldwide. An international collaboration has used UK Biobank to identify more than 100 genetic changes linked to high eye pressure that could pave the way for a genetic-based screening programme for those at greatest risk.

Education and short-sightedness are linked. But it is not clear whether it’s down to more time spent studying, myopic children are more studious, or something else. So researchers used UK Biobank data to find out – and discovered that every additional year of education was associated with more short-sightedness. They said this ‘strong evidence’ has ‘important implications for educational practices’.

Pictures of the eye could be used to identify people at higher risk of heart attack or stroke. Google Research brain team showed that images can accurately predict a major cardiovascular event. With many thousands of images to study and detailed follow-up of participants’ health, the sheer volume of UK Biobank data is bringing important advances in focus.

Ethics Advisory Committee supersedes EGC

An Ethics Advisory Committee (EAC) will replace the UK Biobank Ethics and Governance Council (EGC), which has had ethical oversight of the project since recruitment began. The new committee is chaired by Anneke Lucassen, professor of clinical genetics at Southampton University, who has extensive ethical experience. She is joined on the EAC by Nick Ross, a well-known broadcaster, and who has been involved in national bioethics, and supported UK Biobank since its inception. The EGC has made a considerable contribution to UK Biobank. More recently, it recommended that its oversight role would be better discharged if it were integrated within UK Biobank as an advisory committee of the UK Biobank Board. This recommendation was accepted by the UK Biobank funders and by the UK Biobank Board.

Thank you

We are very grateful to every one of you for giving up your time to participate in UK Biobank. The resource has driven innovation and generated excitement and interest from the world’s top health researchers. Thousands are now using UK Biobank to ask lots of questions about health, with the goal of better preventing illness, and improving treatments.
Do you work with other studies?
Yes, if you have seen the value in joining UK Biobank, it’s quite possible you have participated in other major health studies as well. For this reason, UK Biobank works with big initiatives like the Million Women Study and the Bristol-based Children of the 90s (ALSPAC) to assess the scientific benefit of combining (or excluding) data on participants in more than one study. We are learning how to link and make best use of this extra data while ensuring participants’ privacy is retained.

Is UK Biobank representative?
It is not possible (& was never intended) to make UK Biobank representative of the country as a whole. UK Biobank’s 500,000 participants are generally healthier, leaner, and smoke less than their fellow countrymen and women, suffering less heart and kidney disease and cancer. However, this well-established ‘healthy volunteer’ effect does not reduce the value of the resource - its large size and diversity of measures means that results will be relevant to most people (in the way that the definitive study to link smoking with lung cancer was undertaken on 50,000 UK, predominantly male, GPs in the 1950s).

Can the pharmaceutical industry use UK Biobank?
Yes. We all want to see the resource used as widely as possible to bring advances in health more quickly, and there are many excellent researchers asking important questions within industry. Very often industry has funds available to undertake the most expensive analyses, the results of which will be put back into UK Biobank for all scientists to benefit (such as UK Biobank’s exome sequencing initiative).

Vitamin D and South Asian population
A study on South-Asian participants highlighted the need for public health strategies to tackle low intakes of vitamin D through diet and supplements. This group of people traditionally has inadequate vitamin D levels due to their darker skin pigmentation, low sun exposure due to dress coverage and a tendency to avoid the sun. This makes it even more important that they eat enough in their diet. In the largest study of its kind, researchers examined more than 8,000 Bangladeshi, Indian, and Pakistani participants and found low levels of vitamin D could be putting them at increased risk of chronic diseases including osteoporosis, cancer and cardiovascular disease.

Previously, UK Biobank reported on the need to use lower BMIs to define obesity in different ethnic groups. They found that the rate of diabetes observed among Whites with a BMI of at least 30 was matched by South Asians with a BMI of at least 22, Chinese with a BMI at least 24 and Black people with a BMI of at least 26.
Following health over many years

The NHS – now celebrating its 70th year – is critical to UK Biobank, because it provides a central place from where we can follow your health. Statistics collected for a wide range of administrative purposes are valuable to studies like UK Biobank because they provide information on hospital admissions and treatments.

UK Biobank is also turning increasingly to health information from general practice. Coded GP data provides lots of information on illnesses like back pain, depression, diabetes and migraine, which are not usually treated in hospital, but cause considerable disability and pain. UK Biobank also receives regular updates from the national cancer register and death statistics.

If you would like to take part in future questionnaires you need to provide us with an email address.

To complete previous ones, or to update your contact details, please visit our website: https://biobank.ctsu.ox.ac.uk/members.cgi

Alzheimer’s and dementia

UK Biobank will be a major focus for research into degenerative disease like Alzheimer’s and dementia. Our imaging will provide hundreds of brain pictures on 100,000 participants – creating a rich research resource of unbelievable size and detail. Additional genetic information and follow-up from health records will add extra value. One study of 300,000 UK Biobank participants has already uncovered three new genes associated with Alzheimer’s disease. The research was led by scientists at Edinburgh University and colleagues in Australia and New York. A spokesperson for Alzheimer’s Research UK said: “The next step is for molecular scientists to assess how these genes contribute to Alzheimer’s and fit it into the existing picture of the disease.”

An important development in our understanding of diabetes has been made using the UK Biobank resource. It was thought that type 1 diabetes was mainly a disease of childhood. However, researchers have shown that it is similarly prevalent in adults. The mistake meant that many people aged over 30 with type 1 haven’t been getting the right treatment as quickly as they should. This now looks set to change. The study was funded by the Wellcome Trust and Diabetes UK.

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