

Merry Christmasfrom
the**Lothian Birth Cohort
1936 Research Team**

Season's greetings from the LBC1936 study team! We would all like to take this opportunity to wish you a happy Christmas and a prosperous New Year.

Another busy year has passed and we have received a great response from you in this wave of testing. And thank you so much for your continued interest and involvement in this unique study. We've made great progress in the last year and in this newsletter we will update you on what's been happening. We hope you have all had a good year.

Mid-point of LBC1936 Study Wave 4!

We are happy to report that Wave 4 of the LBC1936 study has now passed its mid-point. We have already seen half of you, with our 280th participant at the Wellcome Trust Clinical Research Facility in October. At the time of writing this newsletter, 301 of you out of the expected 560, have attended the clinic and we expect to see the remainder of you before the end of 2016.

Thank you to those of you who have already participated in wave 4. This is providing insights into thinking skills, health, lifestyle and brain changes (or lack thereof!) throughout your 70s, and beyond. The new Understanding Sedentary Patterns (USP) part of the LBC1936 project has also been very well received. Many of you so far have been kind enough to wear the monitors that track your sitting, standing and walking in your usual daily

life. This is an important study as it helps us understand if and how sitting patterns might relate to health and cognitive and brain ageing.

For those of you who we haven't seen yet, we look forward to seeing you soon and will be in touch over the next year. Please do let us know if you have moved house, or are about to, so that we can update your address and are able to keep in touch. Details of how to contact us can be found at the end of the newsletter.

The Study Director Becomes a Participant

Below, you can see a picture of none-other than Prof Ian Deary involving himself in the induced Pluripotent Stem Cell (iPSC) project, donating a sample for the first pilot analysis. Pluripotent stem cells can be turned in to different types of cells that make up different tissues and organs in the body. Turning stem cells in to brain cells, for example, will allow us to learn about how brain tissue responds to different environmental challenges. This type of research has huge potential in informing ageing research.



**Prof Deary
providing a
donation
for the iPSC
project**

Extended LBC1936 Study Funding

We are delighted to announce that, following a meeting in late March this year, the Age UK Board of Trustees committed in principle to continue funding the study until 2019! This is very exciting as it will allow for further excellent

research to be produced from the LBC1936 study.

LBC1936 Heading for Prime-time BBC1

The LBC1936 will be featured in a new BBC1 mini-series on ageing, to be broadcast in 2016.

About 40 randomly-chosen LBC1936 cohort members, half a dozen of the LBC1936 team, and sundry directors, producers and camera- and sound-people spent an afternoon at the new Bill Scott Sculpture Centre, Edinburgh. The gallery space was transformed, for the day, into a LBC1936 showcase. There were huge images of your school photos, cognitive test sessions, brain scans, and much more. It was a LBC1936 immersion experience. Some LBC1936 participants talked on camera about their experience in the study, and their views on ageing in general, and on cognitive ageing in particular. Professor Ian Deary, Director of LBC1936, welcomed the participants, and was interviewed on the special contributions made by the study and plans for the future.



Ian Deary with Chris Van Tulleken and the some of the LBC

Ian said, "It was great to see the enthusiasm of the LBC1936 participants for helping with this. It was just a pity we could not bring everyone along. Anyway, the LBC1936ers looked great, though perhaps they looked a bit too young and spry for the programme! Also, in addition to being outshone by the LBC1936 stars, I had to contend with being filmed with a taller, younger and more handsome presenter, the excellent Dr Chris van Tulleken. Although we were all

filmed for the best part of an afternoon and early evening, I think we should expect to have no more than a few minutes on the programme. However, to be featured in such a high-profile programme is solid recognition of how important the LBC1936 participants' results are in the field of ageing research."

Ages of the Brain - Film Debut

CCACE and the LBC1936 study made a significant contribution to a short film premiered in Edinburgh in June and co-directed by CCACE Knowledge Exchange Officer Robin Morton. *Ages of the Brain* profiles the researchers and research of Edinburgh Neuroscience including Ian Deary and other members of the team. It has been viewed over 1,200 times on YouTube, it can be viewed here:

<http://t.co/NIQ1YDfmFD>

The Great British Brain Off



Dr Alan Gow examining the ingredients that might protect the ageing brain

For the second year running, Dr Alan Gow joined forces with compère Susan Morrison and the Cabaret of Dangerous Ideas (from the Beltane Public Engagement Network) to put on a show at this year's Edinburgh Festival Fringe. *The Great British Brain Off* offered an hour of lively, engaging, interactive debate, which examined the various ingredients that might protect (or harm) the ageing brain, much of it gleaned from the Disconnected Mind project. Lifestyle factors discussed included physical activity, diet and smoking, with the audience

determining which factors were explored in detail. To promote the show, a trailer was produced, which has been viewed over 2000 times between the CCACE YouTube channel and Age Scotland's Facebook page and was rated 4* by the Edinburgh Spotlight (<http://www.edinburghspotlight.com/2015/08/review-the-great-british-brain-off/>).

Alan said, *"This was my second year performing in the Cabaret of Dangerous Ideas, and my show explored the lifestyle factors that might protect or harm the ageing brain. While that's the main focus of my research, it was great to delve into that in a completely different forum, and hear what people think about it. Sharing our research broadly is incredibly important, and placing the Cabaret of Dangerous Ideas in the middle of the world's largest arts festival certainly provides quite the stage for that"*.

Disconnected Mind in Morningside - Local Interests

On 28th October 2015 Ian Deary addressed and answered questions from Edinburgh's Morningside Justice and Peace Group. He gave a talk on 'healthy cognitive ageing', reporting the background to, results from, and plans for the LBC1936-Disconnected Mind project. Every seat in the basement of the Open Door Cafe was taken, with over 40 attendees, including a few LBC1936-ers. *"This is a model for these very enjoyable and lively events,"* said Ian, *"and Patricia Robson, the event's chairwoman, should be hired out to make academic meetings run better! She kept the talk to just over 30 minutes which left half an hour for brilliantly-chaired questions. The understanding, enjoyment and engagement from the audience set me up for the day. It was exhilarating"*. Barbara Darcy, organiser for the Group, wrote to Ian afterwards, *"Thank you so much for a clear and stimulating talk today. It was obvious people enjoyed themselves and the discussion went on after you left. It was fascinating to hear of the far-sightedness of the SCRE [the Scottish Council for Research in Education] and how much has been learned from the Lothian Birth Cohorts. We are now*

equipped to respond when friends/family/media come up with wild pronouncements on how to keep our brains young."

Tenovus Medal for Outstanding Research in Biomedicine, Amongst Others

In September 2015, Professor Ian Deary delivered his Tenovus-Scotland Medal Lecture at the Wolfson Medical School, University of Glasgow, during which he highlighted the many important findings from the LBC1936. This prestigious award was presented by Professor Richard Codgell, Hooker Chair of Botany, University of Glasgow, in recognition of outstanding biomedical research made by Ian and his team.

Ian said, *"It is a high honour to be asked to give the Tenovus Medal Lecture, especially as I am a psychologist and the award is for biomedical research. The Tenovus silver medal is a fittingly weighty object! It was a good occasion to give the audience both barrels of the Disconnected Mind/ LBC1936 achievements and showcase examples of the excellent and important work consistently delivered by the superb LBC1936 Team."*



Professor Ian Deary receiving his Tenovus-Scotland Medal in Glasgow

Ian has also received two other highly prestigious awards in 2015. The James McKeen Cattell Fellow Award for his lifetime contributions to the field of applied psychological science was awarded to Ian at the 27th Association for Psychological Science Annual Convention, in May in New York. He also received the Distinguished Contribution Award from the International Society of

Individual Differences (ISID) in July. The latter is only the 3rd time this award has been made in their 30+ year history. Many congratulations Ian!

Medical Research Council Grant Award - The Imaging Continues!

The Medical Research Council recently awarded £1.3M to support the continued brain MRI and carotid artery ultrasound scans of the LBC1936 participants at the Brain Research Imaging Centre at the University of Edinburgh. This secures the 3rd wave of structural and diffusion brain imaging data, along with a 2nd wave of carotid ultrasound measures (separated by 6 years). This grant also provides two research fellow positions to analyse these highly valuable data, running until 2019.

Professor Joanna Wardlaw, Director of Neuroimaging Sciences and of the Brain Research Imaging Centre, said, *“the two grants combined will tell us much more about how the brain is affected during ageing, the impact of exercise, when new diseases are starting and help with testing new interventions.”*

Staff News

Dr Simon Cox has recently taken up a new Research Associate position, which means he will no longer coordinate the LBC1936 study. He will however continue to be a key member of the LBC study team, carrying out brain imaging research on LBC1936 data.

Dr Lucia Ballerini has recently started work at the Division of Clinical Neurosciences, with Professor Joanna Wardlaw, where she will process and conduct research on the Lothian Birth Cohort 1936 brain images. A big welcome to her!

We are delighted to report that Mrs Janie Corley has recently submitted her PhD by Research Publications based on her research on the LBC1936. Janie has worked in the LBC1936 study team for over a decade and many of you will know her from testing sessions at the Wellcome Trust Clinical Research

Facility. Her thesis explores some of the lifestyle factors that might protect or harm the ageing brain and is based on a series of already published papers.



Congratulations to Janie on submitting her PhD thesis

Janie said, *“It has been a pleasure working on the LBC1936 study and I am very grateful to Professor Deary and Age UK for the opportunity to do a PhD, and for their support over the past few years. It is lovely to see the culmination of many years of hard work!”*

Janie will continue to work on the LBC1936 study data collection at the clinic and plans to conduct further research into the links between lifestyle and cognitive ageing with Ian and the rest of the team in Psychology on future projects.



***Ratko Radakovic,
New LBC1936
Study
Coordinator***

This gives a good opportunity for me to introduce myself, Ratko Radakovic, as the new Study Coordinator. I look forward to working with and meeting you as a part of this great study.

News from Age UK

As you know Age UK are full supporters of the Disconnected Mind project and the LBC1936 study. Their Annual Review for 2013/14 and the full Annual Report and Accounts can be found at the following links (of which LBC is a feature!):

http://www.ageuk.org.uk/Documents/EN-GB/Corporate/age_uk_annual_report_2014_15.pdf?dtrk=true

Age UK For Later Life Conference

Age UK's big 'For Later Life' Conference is always a great forum from which to spread the latest LBC1936-Disconnected Mind findings. Ian talked about 'cognitive ability and resilience in later life', highlighting four ways in which the LBC1936 study made, "*unusually valuable contributions*".

Ian said, "*It was literally a great setting, the Great Hall of BMA House in London. The session was well attended and the audience were highly interested and appreciative, and asked good questions. It was also a pleasure to be sharing the session with Ann Hoskins, the Deputy Director of Health and Wellbeing from Public Health England. Her message that 'what is good for your heart is good for your brain' is one that we echo.*" Ian also admits to being star struck by his excellent Chairperson: "*Lynn Faulds Wood was my favourite Watchdog presenter. It was thrilling to have this TV legend as a new convert to the excellence of the LBC1936 participants and team.*"



**Ian Deary
with Lynn
Faulds
Wood,
Watchdog
presenter**

Latest Results

With the data from three waves of the study now available to analyse and publish on and the fourth wave of data steadily coming in, 2015 has been as productive as ever. At the most recent count, more than 50 research papers from the LBC1936 study have been published this year, or are due to be published in early 2016. A sample of this year's publications are listed at the end of the newsletter.

The Revelations of Post-mortem Brain Cells

Of note, Dr Chris Henstridge recently led a publication which reports analysis of the first brain tissue donation from an LBC1936 member. Published in *Acta Neuropathologica Communications*, the paper showcases the breadth and detail of information that can be gathered directly only from brain tissue. The amount of work and the detail of the paper (22 pages) reflects the value of this first donation, and looks to add to our understanding of how cells communicate in different areas of the brain in relation to ageing. This is a hugely valuable contribution to science, for which the LBC1936 members deserve great thanks and appreciation. These generous donations are building a highly informative legacy for research into both healthy ageing and age-related neurodegenerative conditions and make possible novel, promising studies into ways of altering cognitive change.

The article was covered by the New Scientist, and you can view the article here:

<https://www.newscientist.com/article/mg22830450-400-my-brain-collection-could-help-us-all-thrive-in-old-age/>

Would you mind giving us your email address?

We would also like to ask if any LBC participants with email addresses would send us an email to lbc1936@ed.ac.uk containing your LBC number. This is just so we can have up to date records of contact details for notification of LBC related events, information and research initiatives. Your email will not be passed on to anyone.

Newly 'in press'

Dickie, D. A., Karama, S., Ritchie, S. J., Cox, S. R., Sakka, E., Royle, N. A., Aribisala, B. S., Valdes Hernandez, M., Maniega, S. M., Pattie, A., Corley, J., Starr, J. M., Bastin, M. E., Evans, A. C., Deary, I. J., & Wardlaw, J. M. (in press). Progression of white matter disease and cortical thinning are not related in older community-dwelling subjects. *Stroke*.

Harris, S. E., Malik, R., Marioni, R., Campbell, A., Seshadri, S., Worrall, B. B., Sudlow, C. L., Hayward, C., Bastin, M. E., Starr, J. M., Porteous, D. J., Wardlaw, J. M., & Deary, I. J. (in press). Polygenic risk for ischaemic stroke is associated with cognitive ability. *Neurology*.

Hill, W. D., Davies, G., Liewald, D. C., Payton, A., Craig, L. C. A., Whalley, L. J., Horan, M., Ollier, W., Starr, J. M., Pendleton, N., Hansel, N. K., Montgomery, G. W., Medland, S. E., Martin, N. G., Wright, M. J., Bates, T. C., & Deary, I. J. (in press). Examining non-syndromic autosomal recessive intellectual disability (NS-ARID) genes for an enriched association with intelligence differences. *Intelligence*.

Johnson, M. R., 28 authors, Deary, I. J., & Petretto E. (in press). Integrated systems genetics identifies a convergent gene network for memory, intellectual disability and epileptic encephalopathy. *Nature Neuroscience*.

Luciano, M., Marioni, R. E., Valdés Hernández, M., Muñoz Maniega, S., Hamilton, I. F., Royle, N. A., ... Deary, I. J. (in press). Structural Brain MRI Trait Polygenic Score Prediction of Cognitive Abilities. *Twin Research and Human Genetics*.

Newly 'in print'

Booth, T., Royle, N. A., Corley, J., Gow, A. J., Valdes Hernandez, M. A., Maniega, S. M., Ritchie, S. J., Bastin, M. E., Starr, J. M., Wardlaw, J. M., & Deary, I. J. (2015). Association of allostatic load with brain structure and cognitive ability in later life. *Neurobiology of Aging*, 36, 1390-13909.

Corley, J., Kyle, J.A.M., Starr, J.M., McNeill, G., & Deary, I.J. (2015). Dietary factors and biomarkers of systemic inflammation in older

people: the Lothian Birth Cohort 1936. *The British Journal of Nutrition*, 114, 1088–1098.

Cox, S. R., MacPherson, S. E., Ferguson, K. J., Royle, N. A., Maniega, S. M., Hernández, M. D. C. V., ... Deary, I. J. (2015). Does white matter structure or hippocampal volume mediate associations between cortisol and cognitive ageing? *Psychoneuroendocrinology*, 62, 129–137.

Davies, G., 126 authors, Deary, I.J. (2015). Genetic contributions to variation in general cognitive function: a meta-analysis of genome-wide association studies in the CHARGE consortium (N =53949). *Molecular Psychiatry*, 20, 183-192.

Henstridge, C. M., Jackson, R.J., Kim, J.M., Herrmann, A.G., Wright, A.K., Harris, S.E., Bastin, M.E., Starr, J.M., Wardlaw, J.M., Gillingwater, T.H., Smith, C., McKenzie, C.-A., Cox, S.R., Deary, I.J., Spires-Jones, T. L. (2015). Post-mortem brain analyses of the Lothian Birth Cohort 1936: extending lifetime cognitive and brain phenotyping to the level of the synapse. *Acta Neuropathologica Communications*, 3, 53.

Hibar, D. P., Stein, J. L., Renteria, M. E., Arias-Vasquez, A., Desrivieres, S., Jahanshad, N., ... Medland, S. E. (2015). Common genetic variants influence human subcortical brain structures. *Nature*, 520, 224–229.

Karama, S., Ducharme, S., Corley, J., Choinard-Decorte, Starr, J. M., Wardlaw, J. M., Bastin, M., & Deary, I. J. (2015). Cigarette smoking and thinning of the brain's cortex. *Molecular Psychiatry*, 20, 778–785.

Marioni, R. E., Shah, S., McRae, A. F., Ritchie, S. J., Muniz-Terrera, G., Harris, S. E., Gibson, J., Redmond, P., Cox, S. R., Pattie, A., Corley, J., Taylor, A., Murphy, L., Starr, J. M., Horvath, S., Visscher, P. M., Wray, N. R., & Deary, I. J. (2015). The epigenetic clock is associated with physical and cognitive fitness in the Lothian Birth Cohort 1936. *International Journal of Epidemiology*, 1–9, doi: 10.1093/ije/dyu277.

Ritchie, S. J., Bastin, M. E., Tucker-Drob, E. M., Maniega, S. M., Engelhardt, L. E., Cox, S. R., ... Deary, I. J. (2015). Coupled changes in brain white matter microstructure and fluid intelligence in later life. *Journal of Neuroscience*, 35, 8672–8682.



Thanks again

As a member of the LBC1936 you are helping to further our knowledge and understanding of how our thinking skills and lifestyles change over time and how to maintain these, along with brain health. From all of the LBC1936 research team, we send a big thank you. We look forward to seeing you in 2016 and beyond.

Yours sincerely,

Professor Ian J. Deary,
Study Director

Mrs Janie Corley
Dr Dominika Dykiert
Dr Simon Cox
Mrs Alison Pattie,
Miss Adele Taylor
Miss Ciara Madden,
Research Associates

Mr Ratko Radakovic,
Study Co-ordinator

Mr Paul Redmond,
Database Manager

Would you like to talk to us?

You can contact us at:

Lothian Birth Cohort 1936,
University of Edinburgh,
7 George Square,
Edinburgh,

EH8 9JZ

Telephone: 0131 651 1681

Email: lbc1936@ed.ac.uk



Do, please, let us know if there is any change to your address, or if you would like a copy of any of the papers listed.

You can stay up to date on the most recent LBC research by checking the regularly-updated list of publications at:

www.lothianbirthcohort.ed.ac.uk

and

<https://twitter.com/CCACE>

