

Study Title: SEARCH trial legacy study: long-term follow-up of participants using electronic health records

Short title: SEARCH Trial Legacy Study

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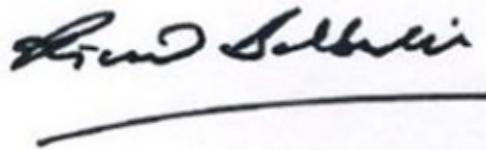
A handwritten signature in black ink, appearing to read "Richard Bulbulia", is written over a horizontal line.

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1 SYNOPSIS

| | | |
|--|---|---|
| Study Title | SEARCH trials legacy study: long-term follow-up of participants with electronic health records | |
| Internal ref. no. / short title | SEARCH Trial Legacy Study | |
| Study Design | Extended follow up of randomised controlled trial using electronic health records and other routinely collected data. | |
| Study Participants | UK participants in SEARCH trial | |
| Planned Sample Size | SEARCH UK=12,064 | |
| Planned period of research | Planned analyses based on at least 20 years' follow-up from trial initiation (1998) with continued data linkage to allow for future analyses. | |
| | Objectives | Outcome Measures |
| 1 | To determine whether participants randomly allocated to treatments leading to lower levels of LDL cholesterol during the scheduled treatment period have a lower risk of dementia | Dementia measured in trial records, hospital episode, death and other health records up to data linkage date |
| 2 | To determine whether participants randomly allocated to treatments leading to lower levels of LDL cholesterol during the scheduled treatment period have a lower long-term risk of major vascular and other diseases. | Vascular diseases measured in trial records, hospital episode, death and other health records up to data linkage date |
| 3 | To measure the association between baseline and in-trial vascular risk measures with future dementia | Dementia measured in trial records, hospital episode, death and other health records up to data linkage date |
| 4 | To measure the association between baseline genetic and blood biomarkers and the occurrence of later disease | Vascular diseases, dementia, neurological disease and other outcomes |
| 5 | To explore effect of folate supplementation on cancer incidence during extended follow-up | Overall and site specific cancer incidence |

2 ABBREVIATIONS

| | |
|--------|--|
| ASCEND | A Study of Cardiovascular Events iN Diabetes |
| ASCOT | The Anglo-Scandinavian Cardiovascular Outcomes Trial |
| CAG | Confidentiality Advisory Group |
| CTSU | Clinical Trial Service Unit |
| EHR | Electronic health record |
| ELISA | Enzyme-Linked Immunosorbent Assay |
| FDA | US Food and Drug Administration |
| HES | Hospital Episode Statistics |
| HDL | High-density lipoprotein |
| HR | Hazard ratio |
| HRA | Health Research Authority |
| ICF | Informed Consent Form |
| K-M | Kaplan Meier |
| MI | myocardial infarction |
| MRC | Medical Research Council |
| NDPH | Nuffield Department of Population Health, University of Oxford |
| NIH | National Institutes of Health |
| PPIE | Patient and Public Involvement and Engagement |
| PPV | Positive Predictive Value |
| REC | Research Ethics Committee |
| RR | Risk ratio |
| SEARCH | Study of the Effectiveness of Additional Reduction in Cholesterol and Homocysteine |
| THRIVE | Treatment of HDL to Reduce the Incidence of Vascular Events (HPS2-THRIVE) |
| UKPDS | United Kingdom Prospective Diabetes Study |

3 BACKGROUND AND RATIONALE

3.1 SEARCH

SEARCH was a randomised, multi-centre, factorial trial of LDL cholesterol lowering comparing higher versus standard dose simvastatin, and homocysteine lowering comparing folic acid and vitamin B₁₂ supplementation versus placebo in 12,064 patients with a history of myocardial infarction (MI).¹ It was run in 88 UK clinical centres for ten years from 1998 to 2008. This study, in combination with other available data, showed that additional LDL lowering with a high dose statin further reduced major vascular events,¹⁻³ but that folic acid and vitamin B12 supplementation did not have beneficial effects on vascular outcomes.⁴

In the vitamin comparison, during a median 6.7 years of follow-up, major vascular events occurred in 1537 of 6033 participants (25.5%) allocated folic acid plus vitamin B12 vs 1493 of 6031 participants (24.8%) allocated placebo (risk ratio [RR], 1.04; 95% confidence interval [CI], 0.97-1.12; P=0.28), with no demonstrable effect on fatal or nonfatal ischaemic or haemorrhagic stroke (269 vs 265, RR 1.02; 95% CI: 0.86-1.21).

In the simvastatin comparison, major vascular events occurred during the scheduled treatment period in 1477 (24.5%) of the 6031 participants allocated 80 mg simvastatin versus 1553 (25.7%) of the 6033 allocated 20 mg simvastatin (RR 0.94, 95% CI: 0.88-1.01; p=0.10) with no significant effect on fatal or non-fatal ischaemic or haemorrhagic stroke (255 vs 279, RR 0.91, 95% CI: 0.77-1.08), p=0.3).

3.2 CHOLESTEROL LEVELS AND DEMENTIA

Cholesterol levels are of particular interest because a genetic risk factor for Alzheimer's disease is the ε4 allele of the ApoE gene. This allele codes for the E4 isoform of a lipid chaperone which is found in intermediate density lipoprotein and chylomicrons. It binds to receptors in low-density lipoprotein and other lipid transport species, and is involved in the neuronal transport of cholesterol. People with an ε4 allele have higher levels of total cholesterol (about 0.25-0.5 mmol/L higher) and triglycerides than those without, and therefore higher blood LDL cholesterol is one potential mechanism for the effect of the ε4 allele.⁵ In the brain, the role of ApoE is less certain, but it is clearly a strong risk marker for dementia.

In observational studies, higher midlife total cholesterol is associated with later life cognitive impairment or dementia⁶⁻⁸ though the magnitude of this effect, the associations with lipid sub-fractions, or the extent to which this is mediated by confounding by other vascular risk factors is unclear. Two meta-analyses that mixed observational studies with randomized trials suggested statins reduce the risk of dementia by about a third (OR 0.70: 95% CI 0.59- 0.83),^{9,10} although there was no evidence of reduction in cognitive impairment at the end of the scheduled treatment period in the large randomised trials.¹¹

Nor did either of the randomised trials that measured short term (<5 years) cognitive performance as a pre-specified outcome show any reduction in the rate of deterioration of

cognitive abilities or end of trial cognitive ability with pravastatin¹² or simvastatin.¹³ There does not seem to be any effect of statins on the rate of deterioration of dementia once it has developed, although the trials have all been small (<1000).^{14,15} A recent Mendelian randomisation study of 3,904 patients with late onset Alzheimer's disease, and 6,664 controls did not show any change in risk of dementia in those with higher predicted lifetime levels of LDL, HDL or triglyceride lipid fractions, though the genetic risk score only explained a small proportion of the variance of lipid levels, and so the study may have been underpowered.¹⁶

In 2012, the FDA added a warning to the statin product label stating that some patients may experience "ill-defined memory loss" and "confusion." This warning followed rare post-marketing reports of cognitive impairment (e.g., memory loss, forgetfulness, amnesia, memory impairment, confusion) associated with statin use. The American Heart Association/American Stroke Association clinical guidelines recommend:

"in people at risk for vascular cognitive impairment, treatment of hypercholesterolemia may be reasonable (Class IIb; Level of Evidence B)."¹⁷

Therefore, there is uncertainty about the long-term effects of LDL-cholesterol lowering with statins or other agents on the risk of dementia.

3.3 VASCULAR RISK AND DEMENTIA

Dementia is a condition that develops over a long period before manifesting in a clinical diagnosis. In the short-term (up to 10 years) lower cardiovascular risk factor levels have often been associated with an increased risk of dementia, which may be because of reverse causal effects of the incipient dementia leading to lower levels. However, raised mid-life levels of cardiovascular risk factors (such as LDL-cholesterol) have been found to be associated with increased risk of dementia 15-20 years later. There is little data, however, on whether raised levels of cardiovascular risk factors at older ages are associated with an increased risk of dementia 15-20 years later. Continued follow-up for dementia in studies in older people initiated many years ago is therefore extremely valuable for investigating such effects now (rather than having to wait much longer for more recent studies like UK Biobank to acquire long follow-up). Our series of large-scale cardiovascular trials from The Heart Protection Study¹³ (HPS) through to the recently completed ASCEND¹⁸ trial have recruited over 60,000 UK participants at high vascular disease risk and with a mean age of about 62 at recruitment.

Dementia is a leading cause of death in the UK and it is likely that over a third of these populations will develop dementia at some point. Hence, many people in these older studies may by now have developed dementia. Therefore, these studies now constitute a uniquely rich resource for study of the relationships of vascular risk factors to dementia incidence many years later. Separately, HES data in HPS and ASCEND studies is being acquired but larger numbers are needed. This study will look at the association of vascular risk factors measured at baseline with dementia incidence at various times into the future, with longer delays between measurement of risk factors at recruitment and incidence of dementia being particularly valuable.

3.4 LEGACY EFFECTS OF LDL-CHOLESTEROL LOWERING

There may be important post-trial ‘legacy’ effects after a period of treatment with LDL-cholesterol lowering agents. LDL cholesterol lowering with a statin might have important effects on the future clinical course of atherosclerosis. Twenty year follow up of the WOSCOPS study demonstrated a reduction in all-cause mortality (HR 0.87; 95% CI: 0.69-0.90), mainly attributable to cardiovascular deaths in the pravastatin arm. There were reductions in hospitalisations for myocardial infarction (24%) and heart failure (35%), although not due to non-cardiovascular causes.¹⁹ In the ASCOT trial long-term follow-up (median 15 years), there were fewer deaths in participants allocated to atorvastatin than in control (HR 0.85; 95% CI: 0.72–0.99).²⁰

Based on these findings, a follow-up study is proposed that will determine how long the “legacy effect” after LDL-cholesterol lowering lasts, and to understand better the effects of early LDL cholesterol lowering in patients with a history of vascular disease on important long-term clinical outcomes.

3.5 GENETIC AND BIOMARKER ANALYSIS OF THE SEARCH COHORT

In order to improve our understanding of vascular disease and its treatments, genomic and other relevant blood-based analytic studies of cardiovascular and other diseases, as well as its risk factors and potential sequela (e.g. cognitive function), and of patient response to therapy may be undertaken. For example, through the use of genome-wide association studies to identify new genetic determinants, Mendelian randomization to explore potentially causal relationships, genetic risk scores to examine potential interactions and genetic correlations, and other genomic and blood-based studies (e.g. DNA methylation) to examine wider features of the genome and their relevance to the prevention of and treatment for vascular disease. As such, the SEARCH trial data provides a unique opportunity to address and answer questions that other smaller, less well phenotyped studies cannot.

Genotyping/sequencing and generation of other measures within the above remit may be undertaken at specialist laboratories under strict contractual agreements (e.g. REGGENERON, USA; McGill University, Canada; Leicester, UK). All data will be returned to Oxford for statistical analyses.

4 STUDY DESIGN

4.1 Extended Follow Up Of A Randomised Controlled Trial Using Electronic Health Records And Within Trial Data

Record level data is requested from Data Custodians such as NHS England, Public Health Scotland, Digital Health & Care Wales, and the Secure Anonymised Information Linkage Databank (or appropriate equivalent registries) after all necessary approvals have been granted with repeat requests on an ad-hoc basis. The data requested will include, but will not be limited to, Hospital

Episode Statistics (HES), mental health data, cancer data, and mortality data and their equivalents in devolved administrations.

5 STUDY OBJECTIVES

1. To determine whether participants randomly allocated to treatments leading to lower levels of LDL cholesterol or lower homocysteine have a lower risk of dementia
2. To determine whether participants randomly allocated to treatments leading to lower levels of LDL cholesterol or lower homocysteine have other long-term health effects
3. To measure the association between baseline and in-trial vascular risk measures with future dementia
4. To determine the association between DNA and plasma markers with dementia and other long-term health effects, particularly lipid fractions and ApoE alleles
5. To explore the effect of folate supplementation on cancer incidence (overall and site-specific)

6 STUDY POPULATION

All participants in SEARCH where linkage is possible to resources held by NHS Data Custodians in England, Scotland, and Wales.

7 INTERVENTION

No interventions are planned as part of this study.

8 OUTCOME ASCERTAINMENT

The following outcomes will be measured in linked electronic health record data: dementia, stroke, all major cardiovascular disorders, other vascular disease complications, myopathies, heart failure, cancer, renal impairment, other health and care outcomes and death. UK participants will be linked with the following datasets:

1. NHS England: Hospital episode statistics (HES) Admitted Patient Care, Mental Health datasets, Cancer Registrations and Civil Registration of death
2. Digital Health and Care Wales (DHCW): Patient Episode Database Wales; Admitted Patient Care
3. PHS (Public Health Scotland): Scottish Morbidity Record (SMR) Inpatients (SMR01), Cancers (SMR04), and NRS deaths
4. SAIL (Secure Anonymised Information Linkage Databank): Cancer datasets
5. Existing data within SEARCH systems and records.

Events occurring in-trial will be defined as in the original trial procedures. Definitions are:

Stroke

Stroke will be defined as an acute symptomatic episode of focal or global neurological dysfunction caused by brain, spinal or retinal vascular injury as a result of infarction or haemorrhage.

Stroke Data sources

EHR/death records

ICD codes will be used to define stroke of different types when recorded in the primary or secondary position (approx. to 94% (95% CIs 88% to 98%) PPV, pers. comm. Kristiina Rannikmae). Date of diagnosis will be recorded. Note: no laterality is likely to be available in these records.

Within trial assessment of stroke

Dementia

Dementia is defined as a chronic or persistent disorder of the mental processes caused by brain disease or injury and marked by memory disorders, behavioural and psychological symptoms with impaired reasoning. For the purposes of analysis, all cause dementia will be used. In secondary analysis, should there be sufficient data, vascular dementia will be looked at, Alzheimer's dementia and other dementias and a broader outcome including all outcomes indicative of cognitive impairment.

Dementia Data sources:

EHR/death records

Mental health records

Within trial measurement of dementia

Myocardial infarction:

HES Admitted Patient Care - definition of MI

MI Data sources:

EHR/death records

Within trial measurement of myocardial infarction

In addition, other codes will be examined indicating major vascular and other diseases, including (not limited to):

- Admissions and deaths due to heart failure
- Surgery on large arteries: aorta, carotid, brachial, femoral, iliac etc.
- Acute coronary syndromes
- Cardiac revascularisation procedures by interventional cardiologists or cardiac surgeons
- Cardiac valve surgery
- Renal replacement therapy
- All mortality

Cancer Data sources

EHR/death records

Within trial measurement of cancer occurrence

9 DISSENT

Participants who have already opted out from having their data stored by a Data Custodian (e.g. NHS England) will be excluded. In addition, participants who have read the privacy notice and have decided that they do not wish their data to be used in this study will be able to opt out. The privacy notice is available on the trial website <https://www.ctsu.ox.ac.uk/research/search> (previously <http://www.ctsu.ox.ac.uk/~search/>), and is a supplement to the NDPH Privacy notice (<https://www.ndph.ox.ac.uk/about/data-privacy-notice-1/ndph-privacy-policy-for-research-participants>)

10 GENETIC AND PROTEIN BIOMARKER ANALYSES

During the SEARCH study, participants provided blood samples for long-term storage and subsequent analyses. SEARCH has an extensively phenotyped database, and active follow-up during the scheduled treatment period (in particular, for mortality, major vascular events, cancer and other major morbidity).

Genetic, proteomic and metabolomic analyses can provide additional valuable scientific insight into treatment response, the risks and causes of cardiovascular event and other related chronic diseases and potential sequela (e.g. cognitive function) especially when linked to traditional biomarker and extensive phenotypic data and to long-term prospective follow-up information. As such, the SEARCH data provides a unique opportunity to address and answer questions that other smaller, less well phenotyped studies cannot.

In order to improve understanding of vascular disease and its treatments, genomic and other relevant blood-based analytic studies may be undertaken in stored buffy coat and plasma to ascertain between markers of cardiovascular disease, as well as its risk factors and consequences, and of patient response to therapy.

Genomic and blood-based analyses may be undertaken as appropriate to address a wide variety of aims in order to generate new biological insights and influence therapeutic developments including:

- Assessing clinical benefit of therapy by strata of genetic risk/polygenic risk scores
- Identifying genetic determinants of treatment efficacy and adverse events as well as wider cardiovascular risk factors and outcomes using hypothesis-free genome-wide association analyses as well as candidate gene approaches
- Determining the causal relevance of risk factors and therapeutic mechanisms for disease as well as the potential effects of treatment using Mendelian randomization analyses

- Elucidating functional mechanisms relevant to the prevention and treatment of cardiovascular disease by exploring rare variation in coding regions using single-variant and gene-burden tests

10.1 METHODS

Any genome-wide genotyping would be undertaken using the up-to-date genome arrays, which combines genome-wide content, curated clinical research variants, and quality control markers for precision medicine research. Subsequently, genomic assays would be performed, such as exome sequencing, as appropriate.

Genotyping/sequencing and generation of other genomic and biomarker measures within the above remit may be undertaken at specialist laboratories under strict contractual agreements (e.g. REGGENERON, USA; McGill University, Canada; Leicester, UK). All data will be returned to Oxford for statistical analyses.

Any protein analyses would be performed using up-to-date proteomic chips and with individual ELISA tests where these will be expected to provide useful information.

All published research findings will be openly accessible to the public, but there will be no feedback of individual findings to the study participants.

11 STATISTICAL ANALYSES

Analyses of randomised interventions will be by “intention to treat” and results will be displayed using Kaplan-Meier survival analyses. Appropriate survival analysis methods (e.g. Log-rank, Cox-regression analysis) will be used to compare the risk ratios for first occurrence post-randomisation of each outcome of interest (e.g. stroke, myocardial infarction, dementia, mortality) between both allocated treatment groups. The association between baseline vascular risk with later dementia will be assessed.

The first planned analyses will be based on at least 20 years’ follow-up from trial initiation with further analyses planned at approximately 5 yearly intervals based on on-going linkage to NHS records.

12 CROSS-STUDY META-ANALYSES

NDPH has conducted several similar studies (SEARCH, THRIVE, HPS, and REVEAL) with common aims. Due to the similarities between the studies and the cohorts used, where any one study does not give sufficient power for an analysis, the study team will perform meta-analyses to a common protocol. Where the randomised allocations are similar, the study team will perform study level and individual participant data meta-analyses to look at the effect of variables on major health events such as stroke, myocardial infarction and dementia. This work is possible because NDPH has been conducting trials in similar populations over decades and the study cohorts are similar enough to combine. This means that analysis can be done with larger numbers, resulting in better data and the ability to investigate things that wouldn’t be possible

with a smaller dataset. This work could include using data about blood results and genetic information. There will also be methodology work conducted. Any such work would be undertaken within the NDPH, University of Oxford.

An example of work planned includes meta-analysis on major vascular events (MVEs) in a secondary prevention population to investigate how much we can rely on data linkage for participants with prior disease. A separate Protocol describes this work.

13 DATA MANAGEMENT

13.1 ACCESS TO DATA

All data will be transferred, handled and processed in agreement with the Data Sharing Agreements or equivalent contracts with each Data Custodian, and these will be specific to SEARCH. All processing will be subject to Fair Processing requirements.

13.2 DATA RECORDING AND RECORD KEEPING (SEE APPENDIX B FOR DATA FLOW)

NHS Data Custodians hold the linkage between trial participant numbers and participant identifiers. This will allow the Data Custodians to create a dataset of trial participant numbers linked to electronic health records. Data will be received back by Oxford in an encrypted format via a secure transfer method as required by each Custodian. Data will be linked with data already held on participants for SEARCH.

On receipt of data at NDPH, the Senior Data Analyst checks that the returned data is of reasonable quality, applying format, dictionary or look-up checks where practical. Pseudonymised data is then moved to the trial database. Identifiers that are only required for linkage will not be included in the trial dataset but will be kept separately. The pseudonymised trial dataset is passed to analysts and statisticians to conduct analysis as appropriate.

The data will be stored at the Nuffield Department of Population Health (NDPH), Richard Doll Building, and the Big Data Institute, Li Ka Shing Centre for Health Information and Discovery within the University of Oxford. Any NDPH researchers involved will have appropriate training in information governance and in handling confidential and participant sensitive data.

The NDPH servers are protected against unauthorised external access by an appropriate strength firewall. Access to patient identifiable information is protected by the appropriate authentication procedures (user IDs and passwords). Authentication is only given to personnel with an approved need, and authorisation, to access the required data. Only personnel involved in the long-term follow-up study for SEARCH (processing and analysing data) will have authorised access to this data. The University of Oxford is on the ICO data protection register (registration reference: [Z575783X](#)). NDPH also meet the standards of the NHS Data Security & Protection Toolkit (organisation code: [EE133863-MSD-NDOPH-NDPH](#)).

Personal data (including identifiers) will be kept until 2035. After this, anonymised datasets will be kept indefinitely to provide: an audit trail for published findings, ability to respond to regulatory requests for further information and for further analysis.

14 ETHICAL AND REGULATORY CONSIDERATIONS

The protocol, previous informed consent forms, and PPIE, and other supporting materials have been submitted to a Research Ethics Committee (REC) and the Confidential Advisory Group (CAG) for approval. REC approval has been granted by the West of Scotland REC 3 (ref: 19/WS/0115) and support is given by the CAG (ref: 19/CAG/0167).

The Chief Investigator (or their delegate) will submit and, where necessary, obtain approval from the above parties for all substantial amendments to the original approved documents.

Participants will not be approached for further consent and data sharing agreements will be in place accordingly.

15 FUNDING

Nuffield Department of Population Health, University of Oxford.

16 PUBLICATION POLICY

The Investigators will be involved in reviewing drafts of the manuscripts, abstracts, press releases and any other publications arising from the study. Authors will acknowledge the source of funding for the study. Authorship will be determined in accordance with the ICMJE guidelines and other contributors will be acknowledged.

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18 APPENDIX A: PATIENT & PUBLIC INVOLVEMENT & ENGAGEMENT

18.1 PPIE DECEMBER 2023

The most recent PPIE was conducted in December 2023. While there is no longer any contact with the original SEARCH cohort, the PPIE team at the Nuffield Department of Population Health (NDPH), also known as Oxford Population Health, coordinates the work of three Public Advisory Groups (PAGs).

The public contributors were recruited via various methods, such as collaborating with regional and national networks, charities and community groups but also using our communication channels. They come from across the UK with various socioeconomic, ethnic and age backgrounds and were recruited to represent the UK's diverse population and ensure that they bring their unique lived experiences in each study.

At the most recent face-to-face meeting of these groups (on 2nd December 2023), we asked 28 public contributors for their input on the continued use of data for long-term follow-up trials (including SEARCH).

Overwhelmingly participants felt that using data long term after trial participation was a good use of the data. They thought that anyone who had consented to the original trial would likely be willing for their data to continue to be used, and that if it were them (that had been a participant in the trial), they would be happy with this use of data. They also highlighted the importance of communicating information where possible. While the SEARCH team are no longer in direct contact with the trial participants, the study website is used to provide information about the trial, and any results.

18.2 COMMENTS FROM 6 PPI PANELS 2018/2019

The proposed use of patient identifiable data is to identify participants based on similar methods previously used by the NDPH, University of Oxford group in other large-scale trials. The data to be gained is similar to those required for previous studies, in which more than 230 000 participants were identified (without consent) for recruitment into the study with no significant problems encountered, the ASCOT study in Imperial College, and the ACST-1 study. Six patient and public panels were approached to test the acceptability of follow-up in electronic health records of participants from old randomised controlled trials that were designed before long-term follow up in electronic health records was thought to be routinely feasible. The following panels were consulted:

1. SEARCH and HPS2-THRIVE study participants
2. NIHR Stroke Research Network Panel
3. Clinical Trial Service Unit, University of Oxford
4. University College London PPI group
5. ASCOT participants PPI group

6. OCDEM PPI Group

18.2.1 Study participant feedback

Participants from the SEARCH main trial and also another large study (HPS-THRIVE) were approached to give feedback on the acceptability of this protocol from a participant perspective:

“As a participant I am perfectly happy for my data to be analysed as described and cannot believe others won’t be. So I do not think additional consent is required.”

“As a participant in both the SEARCH and HPS2-THRIVE trials I have no problem in giving the OK to this new work.”

“I do not see any issue with the approach and procedure being proposed, and agree the process should effectively manage any risk to confidentiality. I am also of the opinion that participants who sign up for trials want their data used for effective on-going research. I would therefore very much support the study.”

“However after considering your reasons for using this unique data long-term and the fact that through encryption, privacy will be protected; all overrides my concerns.”

18.2.2 NIHR, CTSU and UCL groups

The following questions were asked:

Do you think the research proposed here is of sufficient interest and could have sufficient benefits to warrant linking information from GP and hospital records to participants’ trial data?

Yes: 33/35 (94%)

No: 0

Unsure 2/35 (6%)

Do you agree that in the circumstances described here it is not practical to seek individual patient consent and therefore it is reasonable to carry out the research in the way described here?

Yes: 27/36 (75%)

No: 3/36 (8%)

Unsure 6/36 (17%)

Do you agree that concerns around individual participant privacy are extremely low?

Yes: 24/35 (69%)

No: 4/34 (12%)

Unsure 6/34 (18%)

Do you have any other concerns about the project that have not been made sufficiently clear?

Yes: 6/36 (17%)

No: 26/36 (72%)

Unsure 4/36 (11%)

18.2.3 ASCOT trial participants

Question 1

| | Yes | No | Don't know |
|--|--------------|----|------------|
| Do you think that this research study is a good idea? | 19/19 (100%) | 0 | 0 |

Question 2: Why do you think it is a good or bad idea?

All respondents thought the project was a good idea. Some representative comments:

“More research in an ageing population can only be a good thing”

“It makes sense to carry out a study on dementia”

“Any research into the causes of dementia is a good thing. It is a progressive disease which affects many people”

“I think there will be long term benefits as a result of this. Benefits would not otherwise be evident”

“If [dementia] could be avoided, it would be excellent. It would save the NHS money, families distress and enable those with the disease to continue contributing to their communities”

“Any potential resource held in medical records should be used to advance research and knowledge”

“All research helps”

"If it helps someone it has to be good"

"I would be happy if the ASCOT data could be of assistance in pursuing knowledge of dementia"

Question 3

| | Yes | No | Don't know |
|---|------------|--------------|-------------------|
| Do you have any concerns about such a study being carried out? | 0 | 19/19 (100%) | 0 |

Conclusion

All respondents felt that the research was a good idea, and none had any concerns about the project. No respondent has concerns about the use of medical records for this research question.

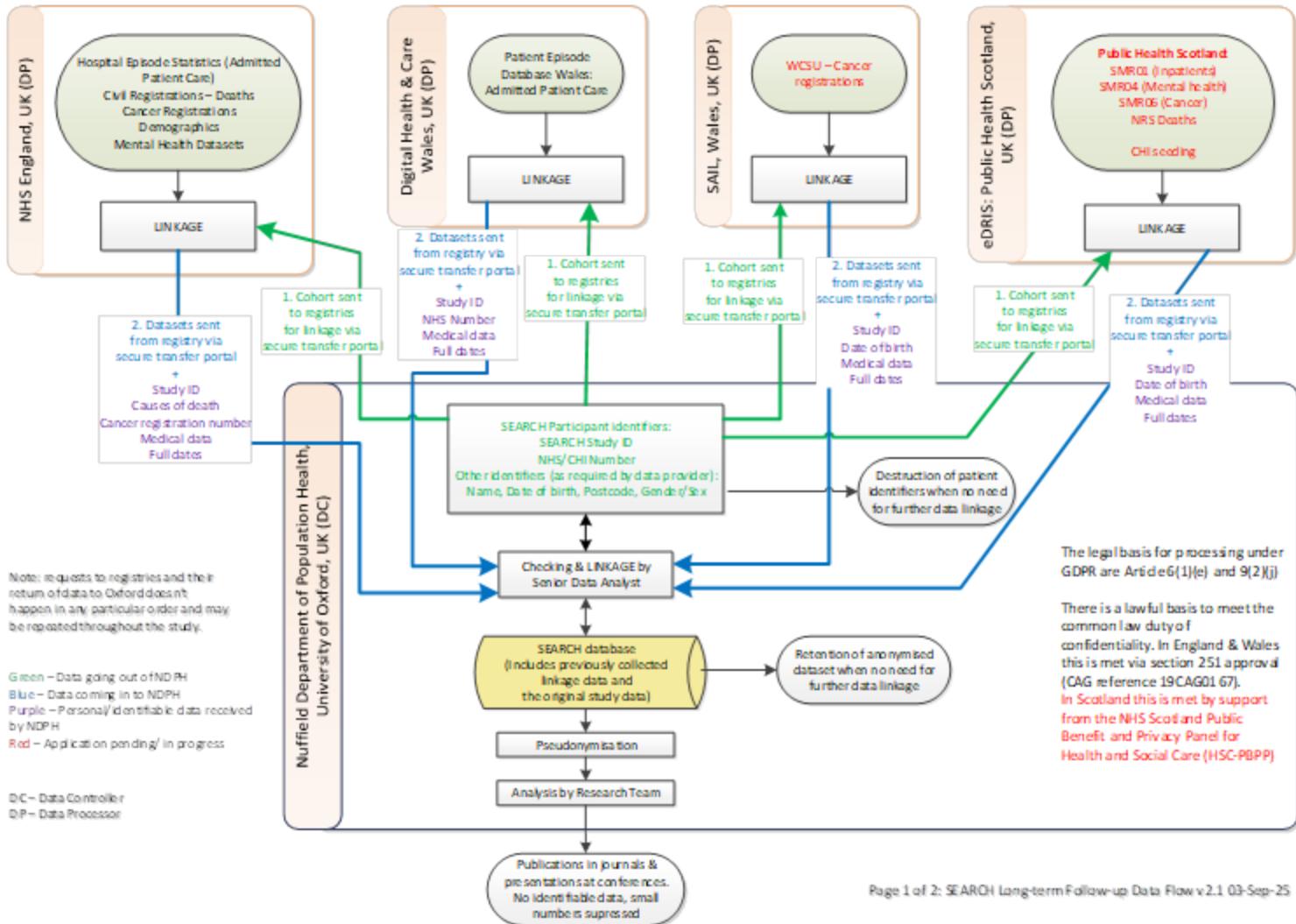
18.2.4 OCDEM PPI Group

| | 1 | 2 | 3 | 4 |
|--|---|---|---|---|
| Do you think this research study is a good idea? | Yes | Yes | Yes | Yes |
| If YES, please say why | Any study that can reduce the worst effects of diabetes should be supported. Any reduction that can be made in the number of diabetic amputations should be actively promoted | It seems sensible to me to that we study if the risk of complications (for T2D) can be reduced by the use of certain medications and what the benefits might also be. | It is well known that poorly controlled diabetes increases the chance of heart disease, strokes, kidney failure etc., so any research that can give possible improvements in treatments / medicines has to be a very good thing | If a correlation between long term blood glucose control and dementia, death or other major diseases (e.g. heart attacks, strokes and kidney disease) can be established, then it is potentially worth investing in research to establish the cause(s). |
| If NO, please say why | | | | |
| Do you think it is acceptable to look further at the data from participants in UKPDS without asking for consent again? | Yes | Yes | Yes | I don't know |

| | | | | |
|---|--|---|--|--|
| If YES, please say why | Once one has given permission to take part in a study, it should follow on that continuation studies MUST be included | Had I signed up for the original study then I would have no objection – so I am carrying that logic forward | Patients have already given you permission to look at their data; exploring that data further is no more intrusive than the first study and will expand knowledge on how diabetes may lead to dementia or other conditions if controlled | It depends on the exact nature of the consent they gave for the UKPDS research. I.e. what did the consent form they signed say? E.g. if the form said that they would be contacted should further use of their data be a possibility, then it does not seem reasonable to use their data without requesting explicit permission for further use of that data. |
| If NO, please say why | | | | |
| Do you have any other comments about this research? | See my initial comments | I would insist that the electronic data interface described is robust and not a laptop on a train ... | Given the number of people being diagnosed with diabetes and the huge costs to the NHS any research that may lead to improvements in care has to be a good thing. Patients also need to be proactive in their treatment | |

19 APPENDIX B: DATA FLOW DIAGRAM

(1) SEARCH Data Flow Diagram – Data requested from 2022 onwards



20 APPENDIX C: AMENDMENT HISTORY

| Amendment No. | Protocol Version No. | Date issued | Author(s) of changes | Details of Changes made |
|---------------|----------------------|-------------|----------------------|---|
| 01 | v2.0 | 13-Nov-25 | Michelle Nunn | <ul style="list-style-type: none"> • New Chief/Principal Investigator Richard Bulbulia • Addition of Statistician Jemma Hopewell • Addition of new objective: To explore effect of folate supplementation on cancer incidence during extended follow-up • Protocol has been updated to reflect more recent information about the long-term follow-up work. This includes: <ul style="list-style-type: none"> ○ Update of datasets being used for linkage ○ Use of 'NHS Data Custodians' as collective term for Data Providers ○ Correction of names of data providers e.g. NHS Digital is now NHS England, Information and Services Division Scotland is now Public Health Scotland, and removal of Northern Ireland. ○ Addition of DHCW and SAIL as a data providers ○ Update to Data Flow Diagram to include correct provider names and addition of Wales. ○ Addition of more recent PPIE • Addition of the Big Data Institute, Li Ka Shing Centre for Health Information and Discovery as a data storage location. • Genomic, phenotypic and outcome data to no longer be shared with collaborators for specific studies. |