LSC TRE EOI

Contents

Draft of North West SNTRE EOI

Contents

RESPONDENT DETAILS

LOCALITY NAME:

LEAD NHS DELIVERY ORGANISATION:

Please indicate which NHS England region your partnership is part of: ☐East of England ☐London ☐Midlands ☐North East and Yorkshire ☐North West ☐South East ☐South West

LEAD RESPONDENT Name:

Job Title:

Organisation:

Email:

Phone:

SENIOR RESPONSIBLE OFFICER (If different to Lead Respondent) Name:

Job Title:

Organisation: Email:

Phone:

DIRECTOR OF FINANCE Name:

NHS Trust:

Email:

Phone:

OPERATIONAL SERVICE LEAD (Requirement to qualify for Wave 1) Name:

Email:

Phone:

SENIOR TECHNICAL LEAD (Requirement to qualify for Wave 1) Name:

Email:

Phone:

PATIENT and PUBLIC INVOLVEMENT and ENGAGEMENT (PPIE) LEAD (Requirement to qualify for Wave 1) Name:

Email:

Phone:

Are you expressing an interest in Wave 1 funding? (Please ensure you meet the eligibility criteria)

☐ Yes ☐ No

If you are expressing an interest in Wave 1 funding, do you have a letter of support from your nominated Director of Finance with commitment to spend £2.5m Public Dividend Capital and £1.3 million revenue by the end of March 2023?

☐ Yes ☐ No

Please attach the letter of support as part of your submission.

MATCHED FUNDING (WAVE 1 ONLY)

> ℹ **Note**
>
> If you are expressing an interest in Wave 1 funding, please outline existing, or planned, local investment in infrastructure or resources which will contribute to ‘in-kind’ matched funding for the SDE for R&D. Please estimate the total value of local ‘in-kind’ investment.

Staff resources:

- ACIO Data Science: NHS Consultant, 7 PA (or a proportion of this)
- Data Scientist: 8a 1FTE
- Cloud engineers: 0.2FTE x 2
- Technical architect: 0.1FTE

Infrastructure investment:

(these are approximate - Saeed will have more details)

- Azure cloud: £150,000
- Includes landing zone and express route as well as WVD/DataPlatform subscriptions

Data Assets investment:

- OHDSI/OMOP: £250,000 over 3 years (committed in 21/22)
- TriNetX: On-prem hosted solution that will be incorporated into SDE
- *Data warehouse investment so far?*

SDE FOR R&D PARTNERSHIP

> **Note**
>
> Please provide the full list of organisations that are currently committed to participate in your SDE for R&D programme (Integrated Care Boards, NHS Trusts, Local Authorities, Higher Education Institutions, Academic Health Science Networks/Centres, Biomedical Research Centres, Applied Research Collaboratives etc.)

Lanchashire and South Cumbria

- Lancashire and South Cumbria ICS (do we need details here?)
- Lancaster University
- University of Central Lancashire
- University of Manchester
- Manchester Metropolitan University
- ☐ Hartree Centre (confirm with Richard Harding)
- ☐ Northwest Clinical Research Network (get letter of support from Sally Stewart)
- ☐ Northwest Applied Research Collaborative
- ☐ MLCSU (confirm with Phil Rowley/Debbie Bywater)
- ☐ Northern Health Science Alliance (chase Paul Brown regarding this.)

Do we need a letter of support from all these partners? In which case, we could prepare a template.

> **Note**
>
> Please provide the names of additional organisations that intend to join, or are considering joining, your SDE for R&D programme by March 2025.

- ☐ ?Leeds/Yorkshire
- ☐ Can we include OMOP federation?
- ☐ North West Ambulance Service
- ☐ Social care

> **Note**
>
> What is the size of the local GP registered population covered by the Integrated Care Boards included in your SDE for R&D? How do you intend to scale this to cover a GP registered population of 5 million or more?

- North-west: 8M
- Lancahsire and South Cumbria ICB: 2M
- Greater Manchester ICB: 3M
- Chesire and Merseyside ICB: 3M

Source: [NHS Digital: Patients Registered at a GP Practice, September 2022]

PATIENT AND PUBLIC ENGAGEMENT

> **Note**
>
> What patient and public engagement activities have you completed which contribute to this project and what were the outcomes?
> What future activities are planned?

LSC TRE has been presented to the Lay Research Resource Group that is part of the Lancashire NIHR Clinical Research Facility based at Lancashire Teaching Hospitals NHS Trust.

We are organising further consultations with patient and public engagement groups through the north-west clinical research network (CRN).

Include GM and CM PPI activities.

> ℹ **Note**
>
> Please describe your approach to ensuring patient and public involvement in SDE for R&D governance and decision making.

KEY RESEARCH PARTNERSHIPS

- ☐ Need details on Neurosciences Exemplar TRE - brief section here and a longer version as supporting documentation.
- ☐ Data science student placements and complementary peers projects
- ☐ Modify complementary peers image with NWTRE team instead of LTH datascience team

> ℹ **Note**
>
> Describe existing successful research partnerships within your locality, particularly those focused on large-scale data sharing and analysis. This may include partnerships with Life Sciences or MedTech companies, Academia, or not-for-profit organisations.

> ℹ **Note**
>
> Provide examples of research projects that will make use of this new SDE for R&D infrastructure as it becomes available. What are the anticipated timescales for commencing these projects?

Neurology Informatics: Lancaster University

Multiple collaborations across several projects with Prof. Emsley, Consultant Neurologist

Stroke and Epilepsy Research: UCLAN

NLP on EPR free-text, Clare Gordon, Senior Research Fellow/Consultant Stroke Nurse

Translational AI in Diabetic Foot Ulcer Monitoring: Manchester Metropolitan University

World’s largest dataset of DFU images (18000+), DFU Challenge. Joint funding bid with MMU for 300K which will allow LTH to recruit AI Engineer. Will use LANDER Azure MLStudio and will be supported by Microsoft ($15k secured)

Natural Language Processing on medical text

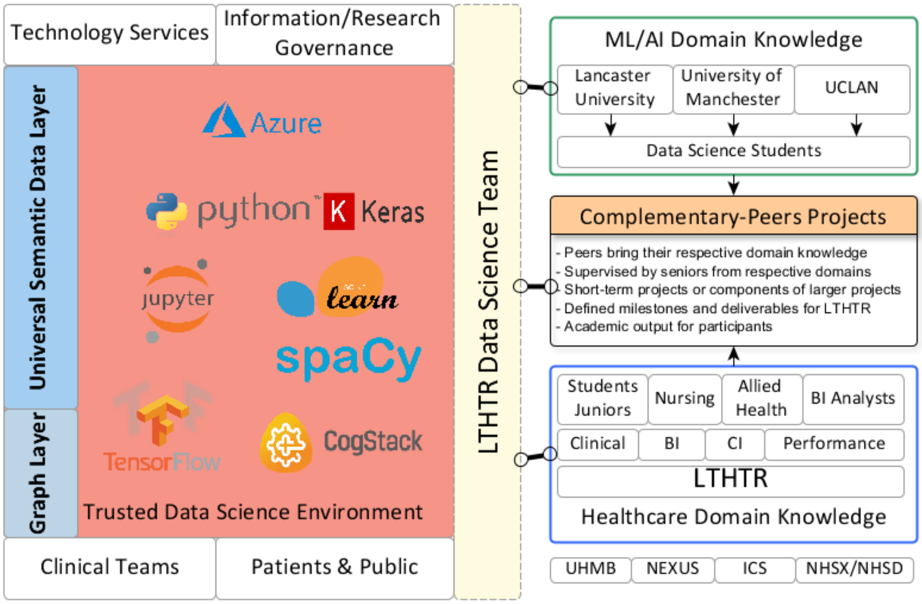
King’s College Longon https://cogstack.org/ Multiple use cases: Clinic Letters, Radiology Reports, Coding accuracy of hospital episodes Collaboration with King’s College London

Friends and Family Test Sentiment Analysis

Imperial College London In collaboration with Continuous Improvement and FFT Teams

Frailty, Colorectal cancer

Data science student projects led by clinical staff and supported by data science team, Lancaster University and University of Manchester

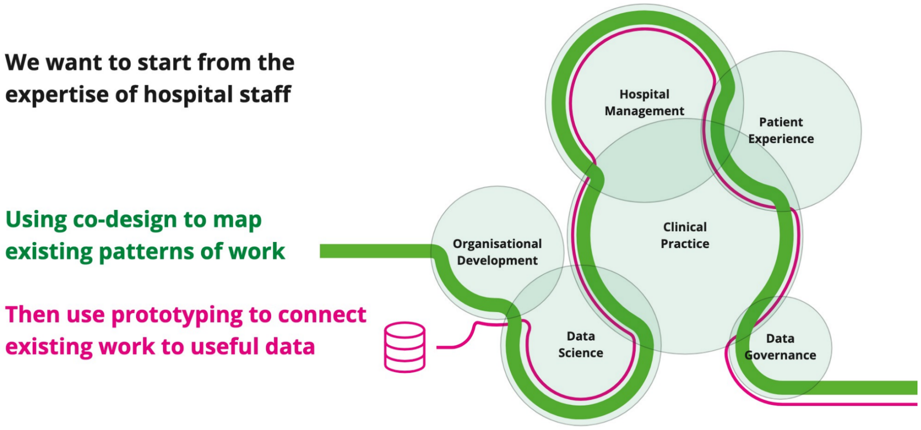


- Peers bring their respective domain knowledge
- Supervised by seniors from respective domains
- Short-term projects or components of larger projects
- Defined milestones and deliverables for LTHTR
- Academic output for participants

Fig. 1 Complementary Peers Projects

Patient Flow Modelling: Lancaster University

Co-design collaboration with Imagination Lancaster and Data Science Institute Multi-disciplinary workshops, complex patient flow, physiological burden and demand modelling


We want to start from the expertise of hospital staff

Using co-design to map existing patterns of work

Then use prototyping to connect existing work to useful data

Fig. 2 Patient Flow Modelling with Imagination Lancaster

GynaeOncology Patient Outcomes Dataset

University of Manchester Led by Nick Wood, Consultant Gynae-oncologist and DMD for Women's and Children's services

Risk Stratified Clinical Harm Reviews

Supports pragmatic prioritisation of high risk patients for clinical harm reviews BI Dashboard that uses algorithm running in LANDER data science cloud computing cluster

TECHNOLOGY AND DATA

Todo:

- ☐ High level architecture diagrams
- ☐ Differentiate between TRE and SDE
- ☐ Include AzureTRE architecture and our work so far

- □ Include ICS BI Datawarehouse details (BedRock) here - and in data assets section next
- ☑ OHDSI/OMOP
- □ Add section on how this benefits federation and our region
- □ OpenSAFELY proposal that was discussed with Ben Goldacre in July/August

> **Note**
>
> Provide information about your SDE for R&D design and the technologies you intend to use.
>
> This should include:
>
> - Technical architecture
> - Infrastructure and data warehousing
> - Data processing and curation
> - Analytical tooling
> - Privacy Enhancing Technologies
> - Data discoverability

Lancashire Teaching Hospitals NHS Trust has built a cloud-first, scalable, secure, trusted research environment (TRE) on Microsoft Azure which will enable research, academic and commercial collaboration and support the move to early intervention and prevention.

The TRE architecture is scalable across the ICS and will ensure interoperability to allow federated access and collaboration between teams in different care settings, academia and industry partners across the region, and globally.

LTHTR is also a member of the Health Data Research UK Alliance further demonstrating our commitment to open, collaborative, big-data research for population health.

Core functions

Highly secure and robust technical architecture AND processes to ensure compliance with 5-safes We have enganged the professional services of Prof. Felix Ritchie, University of West of England and the author of the Five-Safes priniciples to advise us as during the development and implementation of the TRE.

The solution proposed adds immediate value through leveraging proven solutions, standards and best-practice structures already in use across the North West. The proposed solution has interoperability and scalability at the core of its design and allows cooperation between a broad alliance of clinical, industrial and academic contributors.

We propose a decoupled design whereby the analytics layer is developed independent of the data layer while ensuring interoperability between the two.

This will provide quick wins designed around providing actionable insight to pressing ICS priorities by integrating diverse, unique datasets such as: social prescribing, Personal Online Data Stores, ORCHA app prescriptions while allowing for a unified data lake to evolve over time. The analytics layer is not entirely dependent on the underlying data layer to become operational.

The bid builds on existing partnerships and will create a trusted facility for multi-disciplinary, interagency collaboration to provide a richer picture of care and the capacity to upskill the combined workforce, enabling truly joined-up strategic needs assessment and empowering agile, precise population health insights.

The *Ethical Assurance, Clinical & Information Governance Frameworks* will promote public and professional trust in the secondary use of sensitive data, emphasising the openness of the architecture, transparency of the infrastructure and information flows, and explainability of models used to support decision-making.

The interoperability and open-source assets that power the facility will ‘future-proof’ it to comply with and adapt to technical requirements imposed by national & international funders, enable peer review, and retention of skilled staff to maintain, develop and exploit it. It will reduce data & process duplication and improve analytic efficiencies across the health and social care economy, and facilitate collaboration with industry to get value of out data

Safe Settings

- Secure, customisable, scalable, collaborative, cost-effective environments for advanced data analytics

Safe Projects

- TRE DARS + Existing processes (eg. REC)

Safe People

- Researcher training, accreditation; Identity management; User access lifecycle management

Safe Data

- Data/Metadata catalogues to empower self-discovery of data assets for research.
- Common data models for federated research
- Privacy preserving architectures such as OpenSAFELY
- Pseudonymisation/anonymisation depending on use cases

Safe Outputs

- SDC, ML model lifecycle management, explainability tools,
- Interoperability with other visualisation / decision support tools
- NEXUS Intelligence (Population Health Management Platform)
- Aristotle (MLCSU’s visualisation platform to support commissioning)
- CIPHA Population Health platform
- Business Intelligence
- Risk stratification / clinical decision support

Technical Architecture

- Microsoft Azure
- Landing Zone, AVD (VDI) environment, TRE environment
- ☐ Include high level architecture diagrams

Networking

- Express Route connects Azure to On-Prem network
- All assets within Azure TRE are protected with private endpoints and accessed through peered private VNETs
- Azure Firewall and Bastion setup for vendor access

Authentication/Authorisation

- Extensive use of Azure Active Directory and
- Based around principle of least privilige

Data Warehousing

- Currently uses Azure Data Lake Storage V2 (with Azure Files, Blob, Storage Queues and Table storage)
- Proposal to use Azure Synapse / Snowflake

Analytical tooling

- JupyterHub on Azure Kubernetes Service
- Language support: Python, R, Julia, Octave
- Interface support: JupyterLab, Jupyter Notebooks, RStudio Server

- Azure Virtual Desktop
- Custom built Windows 10 Desktop Enterprise Data Science Image
- Language support: Python, R (and possibly any other as required)
- IDE support: VSCode, Jupyter, RStudio
- Database tools: SQL Server Managament Studio, DBeaver, DBBrowser
- Statistical software: JASP
- Productivity tools: Office 365

OHDSI Analytics Stack

OHDSI (Observational Health Data Sciences and Informatics) is multi-stakeholder, interdisciplinary collaborative to derive value out of health data through large-scale analytics using open-source tools. It is composed of multiple components as described below. LSC has committed to a 3-year program work that started in Q1/2022 to map secondary care data into the OMOP model and make it available through the OHDSI analytics stack.

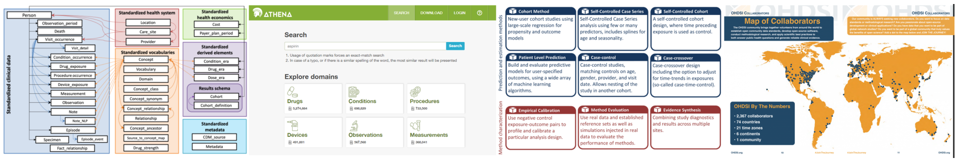

Standardized clinical data
Person
Observation_period
Death
Visit_occurrence
Visit_detail
Condition_occurrence
Drug_exposure
Procedure occurrence
Device_exposure
Measurement
Observation
Note
Note_NLP
Episode
Specimen
Episode_event
Fact_relationship
Standardized health system
Location
Care_site
Provider
Standardized vocabularies
Concept
Vocabulary
Domain
Concept_class
Concept_synonym
Concept_relationship
Relationship
Concept_ancestor
Source_to_concept_map
Drug_strength
Standardized health economics
Cost
Payer_plan_period
Standardized derived elements
Condition_era
Drug_era
Dose_era
Results schema
Cohort
Cohort_definition
Standardized metadata
CDM_source
Metadata
ATHENA
SEARCH
DOWNLOAD
LOGIN
Search
aspirin
Search
1. Usage of quotation marks forces an exact-match search
2. In case of a typo, or if there is a similar spelling of the word, the most similar result will be presented
Explore domains
Drugs 5,274,664
Conditions 698,829
Procedures 733,500
Devices 491,801
Observations 567,568
Measurements 368,041
Prediction and estimation methods
Cohort Method
New-user cohort studies using large-scale regression for propensity and outcome models
Self-Controlled Case Series
Self-Controlled Case Series analysis using few or many predictors, includes splines for age and seasonality.
Self-Controlled Cohort
A self-controlled cohort design, where time preceding exposure is used as control.
Patient Level Prediction
Build and evaluate predictive models for user-specified outcomes, using a wide array of machine learning algorithms.
Case-control
Case-control studies, matching controls on age, gender, provider, and visit date. Allows nesting of the study in another cohort.
Case-crossover
Case-crossover design including the option to adjust for time-trends in exposures (so-called case-time-control).
Method characterization
Empirical Calibration
Use negative control exposure-outcome pairs to profile and calibrate a particular analysis design.
Method Evaluation
Use real data and established reference sets as well as simulations injected in real data to evaluate the performance of methods.
Evidence Synthesis
Combining study diagnostics and results across multiple sites.
OHDSI Collaborators
Map of Collaborators
The OHDSI community brings together volunteers from around the world to establish open community data standards, develop open-source software, conduct methodological research, and apply scientific best practices to both answer public health questions and generate reliable clinical evidence.
OHDSI Collaborators
Our community is ALWAYS seeking new collaborators. Do you want to focus on data standards or methodological research? Are you passionate about open-source development or clinical applications? Do you have data that you want to be part of global network studies? Do you want to be part of a global community that truly values the benefits of open science? Add a dot to the map below and JOIN THE JOURNEY!
OHDSI By The Numbers
• 2,367 collaborators
• 74 countries
• 21 time zones
• 6 continents
• 1 community
OHDSI.org
10
#JoinTheJourney
#JoinTheJourney
11
OHDSI.org

Fig. 3 The OHDSI Ecosystem

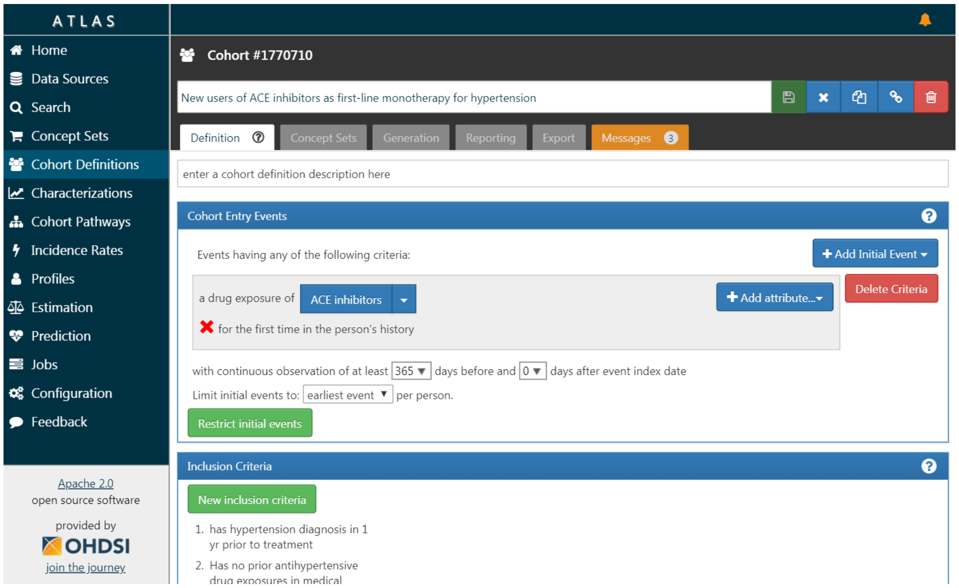
The **OMOP - Common Data Model** allows for the systematic analysis of disparate observational databases by transforming data contained within those databases into a common format (data model). This allows for federated analyses of multiple such databases held at different sites using standard analytic routines without the need to share the underlying data.

The OHDSI network have also created **Athena**, a searchable repository of harmonised standard vocabularies. This is used to map source data to internationally recognised ontologies such as SNOMED, ICD10, LOINC or other ontology of choice, making it interoperable with other similarly mapped data

Once source data has been converted into the OMOP model, this can be subject to exploration and advanced analytics using a large ecosystem of open-source tools.

ATLAS is an open source software tool for researchers to conduct scientific analyses on standardized observational data converted to the OMOP Common Data Model V5. Researchers can create cohorts by defining groups of people based on an exposure to a drug or diagnosis of a particular condition using healthcare claims data. ATLAS has vocabulary searching of medical concepts to identify people with specific conditions, drug exposures etc. Patient profiles can be viewed within a specific cohort allowing visualization of a particular subject’s health care records. Population effect level estimation analyses allows for comparison of two different cohorts and leverages R packages.

ATLAS by design does not reveal patient identifiable information and the built-in privacy preserving features of the OHDSI stack can be enhanced by following further steps during the data transformation process as described here https://ohdsi.github.io/CommonDataModel/cdmPrivacy.html.



Cohort #1770710

New users of ACE inhibitors as first-line monotherapy for hypertension

enter a cohort definition description here

Events having any of the following criteria:

a drug exposure of ACE inhibitors

✗ for the first time in the person's history

with continuous observation of at least 365 ▼ days before and 0 ▼ days after event index date

Limit initial events to: earliest event ▼ per person.

1. has hypertension diagnosis in 1 yr prior to treatment
2. Has no prior antihypertensive drug exposures in medical

Fig. 4 OHDSI ATLAS Web Interface

HADES is a set of open source R packages for large scale analytics, including population characterization, population-level causal effect estimation, and patient-level prediction.

OHDSI International Community

- Global collaborators: https://www.ohdsi.org/who-we-are/collaborators/
- UK data partners: https://www.ehden.eu/datapartners/

AzureTRE

LSC have tested the AzureTRE within their dev environment. We intend to deploy AzureTRE for a clinical research study involving the world's largest multi-modal dataset for diabetic foot ulcer disease. This will make use of Azure Machine Learning Workspaces to manage the entire research lifecycle from data preparation, labelling, model development, model management including explainability and deployment through a mobile application called FootSnap in clinical trials in LTH diabetic foot ulcer clinic.

OpenSAFELY

LSC have had initial discussions with Prof. Ben Goldacre and his team regarding deploying OpenSAFELY within their cloud environment. We are in the process of collating use cases with standardised datasets for this and expect to be able to have this operational in Q4/2002.

CogStack

LSC are an early adopter site for CogStack and LTH has signed an agreement with King's College London to use their advanced NLP models. This project focusses on the "translational aspects" of NLP/CogStack with opportunities to refine the underlying models for multiple specialities. We have developed a cloud-native, fault-tolerant, auto-scaling, general medical text analysis pipeline within LANDER that can be applied to millions of documents including clinic letters, radiology reports and free text from EPR. We are working with the NHSX PhD Internship program to advertise this project and the successful candidate will work to refine this further. The initial focus will be on 6 million clinic documents with other unstructured text data from our EPR, radiology reports and pathology reports to follow. The successful candidate will be embedded within the data science team at LTH. The parts of the solution that are not specific to LTH will be open-sourced on GitHub under the MIT-license with a particular focus on sharing this code back with the CogStack community. The candidate will be peered with a neurology junior doctor with a good understanding of Python programming and neurology domain knowledge and together they will deliver on the Neurology/Epilepsy use case within our Exemplar Neurosciences TRE.

> **Note**
>
> Outline your roadmap to meet the mandatory requirements for SDE accreditation. See (Appendix C) for full detail of requirements.

In very simple terms, LSC intend to work with Microsoft to further co-develop the open source AzureTRE (https://microsoft.github.io/AzureTRE/) architecture. *Include details of Azure TRE here.*

Map some of this to Appedix C (SDE specifications):

- Metadata catalogue and self-discovery, eg. https://github.com/amundsen-io/amundsen or Azure Purview
- Data governance and data lifecycle managememt - Azure Purview
- Workspace level data governance - eg. Azure ML workspace capabilities
- Tools for anonymisation/pseudonymisation eg. https://amnesia.openaire.eu/

DATA ASSETS

Todo

- ☐ Shorten this section. Move some of this to the *technology and data* section
- ☐ Add links to OHDSI web resources
- ☐ Include CDM image

> **Note**
>
> What data assets do you intend to make available to researchers in your SDE for R&D? What data assets will be available by March 2025?
>
> A template is provided (Appendix F) for you to complete, should you wish.

OHDSI/OMOP

Standardising multiple data sources into a single common data model has significant benefits that include easier data discovery, reproducible analysis and federated research using anonymised datasets.

LTH has used Quadramed (Harris Healthcare) as its primary electronic health record (EHR) for nearly 15 years. This has resulted in a large amount of longitudinally collected patient data for over 2.2 million patients. LTH also has multiple other application specific databases that continue to collect valuable data.

At present this data is stored in multiple data silos in non-standard data models and databases which makes large scale data analytics very difficult and often impossible. This poses significant problems in getting value out of this data for the benefit of our patients through service improvement projects or research. Moreover, we are unable to collaborate with other NHS organisations both within the ICS and the wider NHS without allocating significant resources to standardising data to a conformant format.

Data standardization is the critical process of bringing data into a common format that allows for collaborative, large-scale analytics, and sharing of sophisticated tools and methodologies. The Observational Health Data Sciences and Informatics (or OHDSI, pronounced “Odyssey”) program is a multi-stakeholder, interdisciplinary collaborative to bring out the value of health data through large-scale analytics. The OMOP Common Data Model allows for the systematic analysis of disparate observational databases.

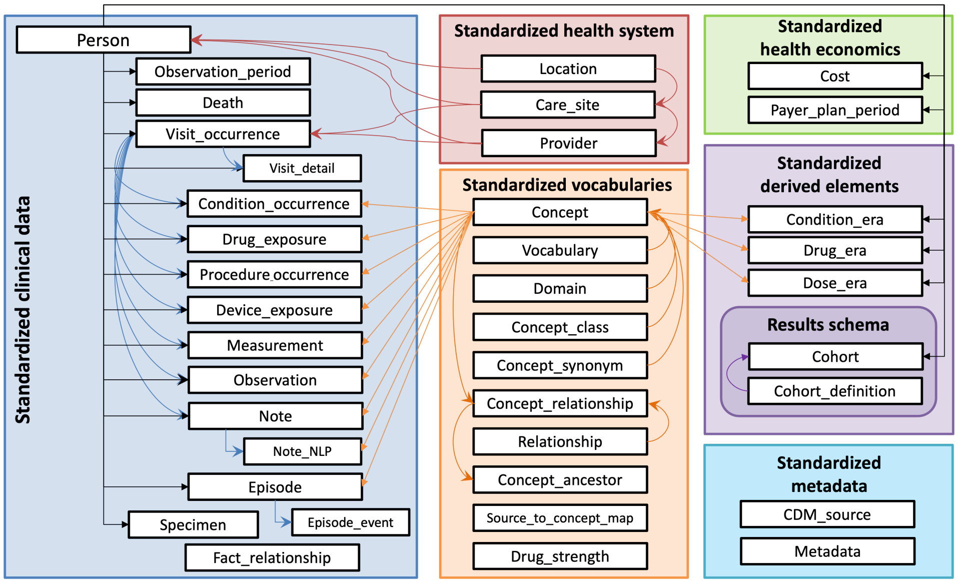


Fig. 5 OMOP Common Data Model 5.4

The concept behind this approach is to transform data contained within those databases into a common format (data model) as well as a common representation (terminologies, vocabularies, coding schemes), and then perform systematic analyses using a library of standard analytic routines that have been written based on the common format. Once a database has been converted to the OMOP CDM, evidence can be generated using standardized analytics tools.

OHDSI have developed Open-Source tools for data quality and characterization, medical product safety surveillance, comparative effectiveness, quality of care, and patient-level predictive modelling, but there are also other sources of such tools, some of them commercial.

OPERATIONS

> **Note**
>
> Describe the operational model for your SDE for R&D. This should cover:
>
> - Operational and management services
> - Technical and data
> - Commercials & finance
> - Comms & business development
> - User permissions
> - Customer account management and researcher support

GOVERNANCE

> **Note**
>
> Describe the leadership and governance structure for your SDE for R&D.
>
> This should cover:
>
> - Leadership and management team (e.g., technical, operational, information governance, PPIE, commercial leads)
> - Governance structure, including stakeholder representation

1 NW TRE Steering Group with equal representation from all ICBs 3 ICB level TRE working groups

Composition:

- NHS
- Academia
- Commercial

INFORMATION GOVERNANCE AND ETHICS

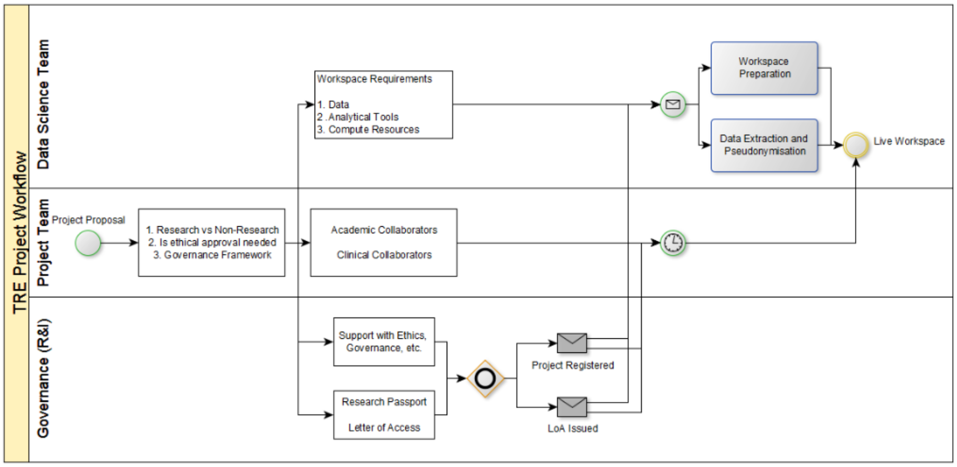
> **Note**
>
> Describe the process researchers will go through to obtain permissions to access and analyse data in a workspace in your SDE for R&D. This should cover:
>
> - User accreditation and permissions
> - Data Access Committee(s)
> - Ethics

GM have already solved this to a large extent.

Precedents to build upon:

- https://digital.nhs.uk/services/data-access-request-service-dars
- https://saildatabank.com/data/apply-to-work-with-the-data/

Flowcharts:



FUNDING

> **Note**
>
> If you receive investment to establish a SDE for R&D outline at a high-level how you intend to spend both the capital and revenue funding that will be available to you by March 2025.

SUPPORTING INFORMATION

> **Note**
>
> Provide details of any other supporting information you wish to include which has not been covered elsewhere.

SCRAPBOOK

TRE vs SDE vs IDL

Bradley/Vishnu

1. Interoperability
2. Multiple capabilities that evolve in parallel over time
3. Avoid monolithic architectures – for data and analytics
4. Embrace pragmatic monolithic architectures for data discoverability, researcher experience, pseudonymisation/anonymisation processes, DARS, etc.

I think you have captured our conversation well. I think the ‘three’ TREs will sit above the transportation/federation layer with the airlock line immediately between the TREs above and the transportation layer below.

I am using the term data lakes and not SDE as NHSE have appropriated the SDE term for the wrong purpose here.

Let’s call our SDEs IDLs (ICB data lakes) to add to the confusion!

Agreed: Data is held in three IDLs (GM, LSC and CM) – each will progress at different pace depending on local needs. Each will also support multiple other use cases both at ICB level (eg. population health) or regional level (eg. commissioning, research, etc.). This supports the “build once, use many” approach which is vital for efficiencies.

Agreed: The data transportation and data discoverability functions will operate across all three data lakes as well as any number of other data sources (eg. CSU, social care, SAIL, NWAS, etc.) that are not part of the ICB data lakes (yet).

Research teams use the data discoverability function to identify what data they require for a particular project and where it is available. They then request this data through the DARS.

Subtly different: The data transportation function (people and processes) will be responsible for pulling this data from the IDLs, curate it, pseudonymise/anonymise as appropriate and after all kinds of 5-safes compliance checks, push this data through the airlock into a TRE workspace – this could be a ELabs workspace, AzureTRE workspace or whatever as long as it meets the criteria. Or expose this data through documented, version-controlled APIs and the research team can pull it on demand – will be more useful where the data is getting refreshed regularly or is a live stream.

Remote Execution: Not all use cases can be solved with remote execution. The EOI spec speaks of a separate code development area and data areas. This doesn’t make sense for many use cases where iterative analysis is part of the process. OpenSAFELY is not the panacea to all privacy concerns. A combination of approaches that pragmatically balances tech and processes to enforce 5-safes will be important – OpenSAFELY +/- OHDSI/OMOP +/- Anonymisation +/- safe people/safe projects.

Two questions remain:

- What happens to anonymised curated datasets prepared for one project after that project is over?
- Do we create curated datasets pre-emptively in the absence of a direct need?

In terms of research use cases, what we are discussing already supports observational research. For trials, we can easily spin up something like RedCap within one of these ‘airlocked’ workspaces. Or anything else for that matter.

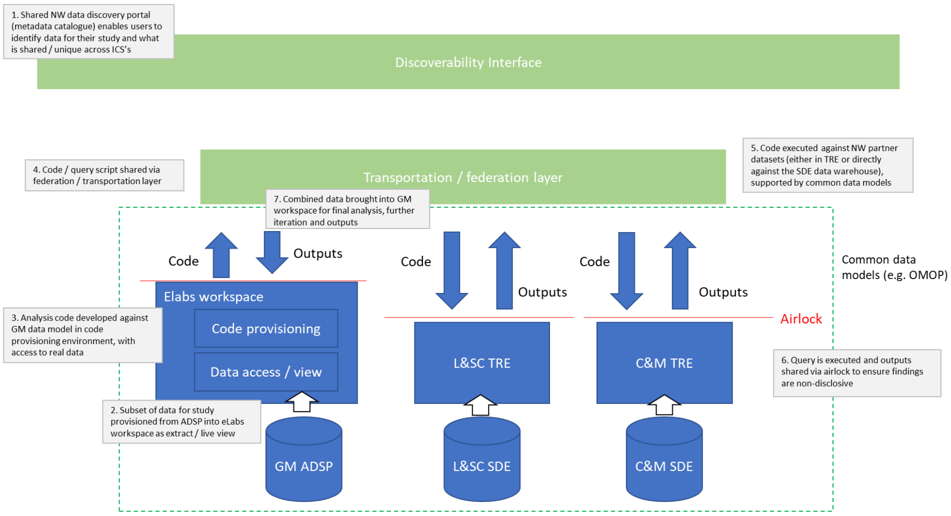
…

From: Bradley Quinn
Sent: 21 September 2022 16:01 To: Chandrabalan Vishnu (LTHTR)
Subject: NW conceptual architecture

Hi Vishnu,

Good to chat just now – a really useful discussion. On the back of our talk I’ve pulled together the diagram below. It is very crude, and doesn’t work in every instance (e.g. clinical trials with consent that require identifiable data, AI development with model training etc) but conceptually, this is my attempt to summarise what I think we are moving towards for a NW solution for federation. Certainly in the nearterm, this would be a way for us to demonstrate that the NW approach works for areas where we already have alignment in data structure (e.g. SUS). I've focused on what it's application would look like to GM but it would equally apply for L&SC / C&M.

Is this an accurate summary?



1. Shared NW data discovery portal (metadata catalogue) enables users to identify data for their study and what is shared / unique across ICS's

2. Subset of data for study provisioned from ADSP into eLabs workspace as extract / live view

3. Analysis code developed against GM data model in code provisioning environment, with access to real data

4. Code / query script shared via federation / transportation layer

5. Code executed against NW partner datasets (either in TRE or directly against the SDE data warehouse), supported by common data models

6. Query is executed and outputs shared via airlock to ensure findings are non-disclosive

7. Combined data brought into GM workspace for final analysis, further iteration and outputs

*NB – this solution only works for research that can operate utilising de-identified patient data (e.g. retrospective epidemiological analysis, service evaluation etc) and which does not require continuous reiteration / training of models (e.g. AI)

The bits in green are "shared" infrastructure (e.g. a single metadata catalogue, a NW federation layer that can lift & shift queries across) – in blue is ICS / local level

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