DARE UK EARLY ADOPTERS

Insights from the DARE UK Early Adopters: Key learnings and outcomes

30th July 2026

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- To ask a question during the Q&A sessions, use the **Raise Hand** feature to speak, or submit your question in the **Chat** before or during the session.
- During the discussions, please remain respectful, do not interrupt others and ensure any questions or comments remain on-topic
- Please keep your **video** off during presentations – you are encouraged to turn your video on during the Q&A/discussion session
- Please note that this session is being recorded and will be shared via DARE UK channels following the event

Agenda for today

1. Welcome and overview of the DARE UK Early Adopter projects
2. **10- minute** presentations from the projects, followed by **5-minute** Q&A

   Running order:

   FRIDGE – Federated Research Infrastructure by Data Governance Extension

   SOAR – Semi-Automated Output Assessment and Review

   VISTA – Viable Implementation of SATRE, SACRO and Tools for AI

   PANORAMA – Pan-North Data Research Advancements for Multi-Domain Access and Analysis

   SAFER – SAIL Advancing Federated Exploration and Readiness

   FOCUS-5 – Federating Operations and Collaborations Using the Five Safes

3. Close

DARE UK Early Adopters

- Competitive selection process
- Funded to work with the DARE UK TREvolution programme
- TREvolution is working to advance TRE capabilities
- Early Adopters explored:
  - what is possible
  - what is acceptable
  - what is useful
- Started February 2025, ended March 2026
- Worked with evolving, capabilities and standards, helping to test and refine these

What's next for TREvolution?

- Continued development of capabilities
- Working closely with the DARE UK SOCRATES Early Adopter Project
- Working with the DARE UK Research Exemplars to use TREvolution tools to conduct real research studies

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RESEARCH EXEMPLARS

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- AIRR-BRIDGE: Bridging Research Infrastructure for Data Governance Extension on AIRR
- BRAID: Brain Frailty Integrated through Data Federation
- CONNECT-AF: Cross-TRE Network for Evaluating Clinical Outcomes and National Trends in Embolic Complications of Atrial Fibrillation
- FRAME: Federated Research on Anti-hypertensives Maternity Emulation Trial
- HEAL-Scot: Housing, Environment and Location Data Linkage in Federated TREs to Map Geospatial Inequalities
- MELODY: Federated Machine Learning for Dermatology
- SAFEVID: Spasms Analysis using Federated Learning from Videos Across Multiple TREs
- TransPECT: Securing AI NLP-Transformer Models for Safe Release in TREs

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VISTA
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Embedding SATRE, SACRO and SACRO-ML in the Eastern England Secure Data Environment

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Laura Clarke - easternsde@healthinnovationeast.co.uk

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VISTA focused on adopting 3 TREvolution capabilities

- **SACRO** – Safe and efficient research output egress
- **SACRO-AI** – Ability to train and safely egress AI models
- **SATRE** – Strengthening trusted, secure and interoperable TREs

PPIE – Placing public perspectives at the heart of the implementation

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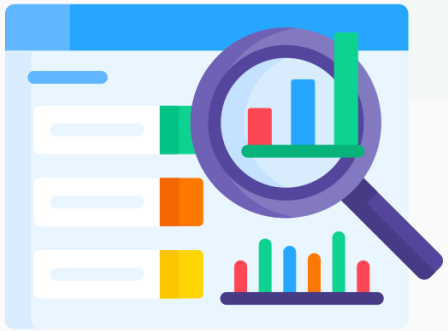
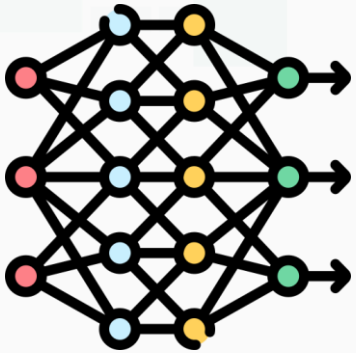
SACRO – Semi Automated Disclosure Control in Practice

Operationalised semi automated disclosure control	Using ACRO and SACRO viewer within the EE-SDE
Complex outputs still require manual review	Not all analytical methods and visualisations are fully supported
Improved consistency, auditability and scalability	Output checking for routine descriptive statistics
Shaped future SACRO developments	With feedback on tools, guidance and implementation approach



SACRO AI – Assessing AI model disclosure risk

Applied SACRO-ML and privacy risk assessment	Evaluated the safe release of AI models from the EE-SDE
Highlighted performance and usability challenges	Such as lengthy runtimes, complex setup requirements and limited visibility of assessment progress
Strengthened AI governance	Introduced a structured approach to assessing model disclosure risk and supporting evidence-based model egress decisions
Provided practical implementation feedback	This shaped future tooling, validation, user guidance and user experience improvements



SATRE – Benchmarking a trusted and secure TRE

Assessed the EE-SDE against SATRE *(see results below)*	Benchmarking trusted and secure TRE operations
Addressed challenges in interpreting SATRE	Guidance focused on on-prem rather than cloud native systems
Used SATRE to drive operational improvements	Strengthened assurance processes and prioritised future investment.
Helped shape the evolution of SATRE	Through national collaboration on control mappings and implementation guidance

	# of statements	Mandatory	Recommended	Optional	Overall
Overall score	147	100%	95%	100%	98%

PPIE – Embedding public trust through VISTA

🟦 **Embedded public perspectives** throughout SACRO, SACRO-ML and SATRE work

🟧 **Involved the Core Public Advisory group** in AI governance and disclosure control activities and TREvolution engagement activities

🟩 **Used public feedback to improve** governance, communication, and AI risk management approaches

🟦 **Increased transparency, accountability and public trust** in the adoption of TREvolution capabilities through engagement and role in Collaboration Cafes

It's been like an informal learning and baseline learning sets, no matter the amount I still don't know, I learn something new at each collaboration cafe. As a public member it can be daunting but in reality, it's very welcoming and all those who live it 'day in day out' as paid staff, take time to explain and accommodate questions." Male public contributor

"I like the fact that the PPI members were invited to the TREvolution cafes as it felt like we were involved in the VISTA project discussions and problem solving. My main issue was following some of the language and concepts mentioned in the discussions as we are working with people who are experts in their field. It has been a positive learning experience but has identified that training in the use of AI and data wouldbe beneficial for lay members." Female public contributor

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SAFER
Insights and Key Learnings & Outcomes

Sharon Heys

30th of July 2026

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Sharon Heys - Head of Legal SAIL

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SAFER

'SAIL Advancing Federated Exploration and Readiness'

- SAFER focused on delivering federation in the real world
- Governance focus - often seen as dull and unexciting
- Explaining governance of federation challenging
- Understanding how key stakeholders feel about federation
- How best to explain data federation to a number of key audiences
- Ensure that SAIL is ready to 'operationalise'
- How to translate complex relationship and tech in the real world
- Concrete outputs: policies, protocols and legal agreements

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TREvolution Capabilities in scope

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- Technical solutions of Teleport, 5 Safes TES, federated learning and how software such as Director would link a network in governance terms
- Understanding technical products and solutions
- Translating the governance implications
- 3 differing models – 3 sets of implications
- Team expertise – legal, governance, compliance and accreditation, business and finance and public engagement
- All required skillsets working to a common aim
- Also had the technical team providing the federated architecture to use as consultants
- Understanding data touch points/journey, divergence from current operating model, mapping process and how and where key parties interact with the processing
- SAIL had operated previous federated projects manually during covid
- Benefit of SAIL's existing experience of almost 20 years

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Benefits of Adoption

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- SAIL views federation as a key area of future development
- Analysis on a broader scale is the next logical step
- Having a framework to facilitate federation is key - governance network
- Engaging in strategic partnerships and collaborations through federation
- Being able to provide answers to the difficult questions that data owners may ask
- Considering the risks and solutions in advance
- Our project uses the technologies and integrates them into existing systems and protocols
- Now entering the next phase - testing this in the ‘real world’
- Working across organisation and legal jurisdictions is challenging
- Without the solutions that SAFER provides federation remains theoretical

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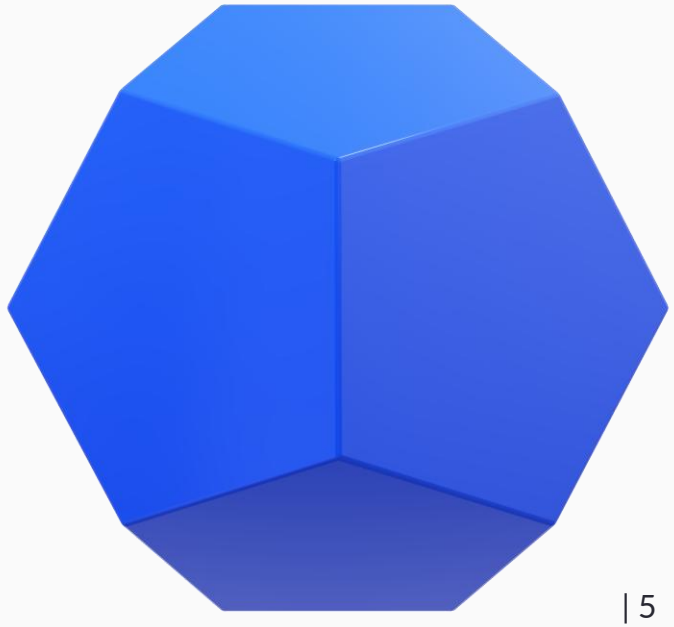
Model Analysis

- Each model different from a governance and compliance perspective
- Carries a different risk profile
- 5 Safes TES and Federated Learning – data does not move

  Risk profile is lower - no movement of raw data - only cleared outputs
- Teleport is the higher risk model - data is transferred to ‘Pop Up TRE’

  Analysis within the Pop Up - SAIL may run the Pop Up or contribute data
- Risk profile different according to role
- Need to consider technical/accreditation controls for running the Pop Up

  Egress from the Pop Up
- How to write this into a Consortium Agreement
- How to keep the Agreement accessible and fit for purpose



Public Involvement and Engagement

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A key deliverable of SAFER

- Series of **open consultations and engagement activities** through in-person/hybrid events and meetings, outcomes of these discussions will inform further engagement plans and outputs.
- **SAIL's public advisory panel**, the **Consumer Panel**: discuss proposals and planned consultations, seek views of acceptability and risks, feed into wider project deliverables and form part of the final report.
- **SAIL's information governance review panel** (**IGRP**): to introduce federation and discuss information and governance changes, challenges and benefits.
- Introducing **'Federated Data'** to wider public members interest in data and TRE governance, including lay participation and consultation to address views, opinions and concerns on the acceptability of model.
- Data Provider Consultations
- Acceptability and differences of federated analytics model(s), governance and legal compliance questions/challenges.
- **Welsh Government**
- **Public Health Wales**
- **Digital Health & Care Wales,** acceptability of federated analytics model(s), governance and legal compliance questions/challenges.

- Leading to:
- **Researchers,** the
- **ICO/Policymakers** and
- Wider **National TREs and SDEs**

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Engagement Activities

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Acceptability of Federation Model - what is it? and how it differs from the current model(s)?

- **Governance & Compliance -** include all major legislation and guidance for UK jurisdictions.
- **Security & Accreditation -** review of compliance issues relating to security certification and accreditations to assess whether federation poses any risk to existing, long standing certifications and whether any potential changes may be required to scope.
- **Legal Changes –** review the legal basis and direct and indirect impacts of federation, and changes to existing SAIL policies and processes that federation may/will require to operationalise.

*Overwhelming feedback was positive as long as standards are maintained

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Feedback to the TREvolution Team

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- Swansea University has been developing a number of the technical solutions
- We were able to discuss the application of the tools and technical solutions
- Numerous discussions surrounding how the technology would work in practice
- Updates in relation to any changes to the models from the team
- Helped our understanding of how governance wrapper would work in the real world
- Feed back through the regular events run by DARE and through our reporting - understanding of fellow early adopters and their outcomes
- Ongoing dialogue and discussion with SAFER team

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Our Approach

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- Partners ‘Opt In’ to use cases and models
- Governance rules set out in the Consortium Agreement
- 18 Schedules: compliance and accreditation, charging and costing, sanctions, governance protocol, terms of reference for the governance board, and data retention
- Right of veto for data owners – flexibility in place
- Provisions to protect against reidentification risk eg licence templates
- Specific protections by model eg indemnity
- Sanctions determined by the Federated Analytics Governance Board
- Reviewed 120 SAIL policies and protocols
- Adapted SAIL data sharing Tripartite Agreement for federation/charging regime to apportion costs

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How the Feedback Influenced TREVOLUTION

- Ongoing dialogue with technical partners
- Discussions at to how complex concepts such as federated learning would work led to solutions such as licensing
- Understanding the practical elements eg security control of Pop Up TRE
- Discussions on where legal risks lie – release of outputs
- Producing a governance model which facilitated the technology
- Symbiosis of technology and governance
- Translating the limitations of applications such as director – requirements of a functioning network and functionality of the technical solutions
- Process was a dialogue leading to practical solutions

Summary

- SAFER involved putting SAIL processes under ‘the microscope’
- Analysis by model was critical
- Took time to understand and discuss each model in detail
- Time spent up front ensuring a clear understanding of the technical processes
- Only then could an appropriate Consortium Agreement and governance structure be created
- Framework to join collaborators with rules of engagement
- Key aim was to take stakeholders with us
- Build public trust
- Allow safe federation
- Realise the benefits for SAIL our partners and the wider NHS

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Findings from the PANORAMA Project

Katherine O'Sullivan
Chief Data Officer
Research Data Scotland

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The PANORAMA Project

- Pan-North Data Research Advancements for Multi-domain Access and Analysis
- Yorkshire & Humber, North East & North Cumbria, North West SDEs, led by researchers at the University of Sheffield
- Early Adopter focussing on feasibility assessments of tools in real-world environments – led to a project on how federation works in practice

Can we enable real-world federation using TREvolution capabilities?

TREvolution Capabilities: What we tested

- SATRE – to support establishing organisation-level federated Information Governance
- 5SafesTES – to support federated analysis
- SACRO – to support federated output checking

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SATRE

Federated Research

SACRO

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Project Outputs – Technical and Operational

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An Evaluation of the Effectiveness of the SATRE Specification to Support the Creation of a Federated Information Governance Framework

PANORAMA Work Package 1 Final Report

Authors

Katherine Bishop[1] (University of Sheffield; Yorkshire & Humber Secure Data Environment) – ORCID: 0009-0001-8723-5114
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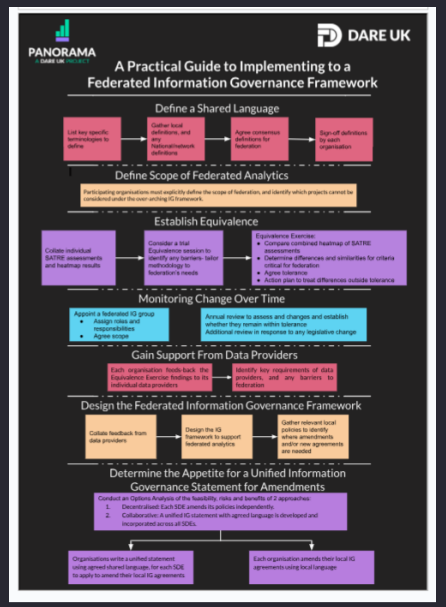

Feasibility Report on Deployability and Use of 5 Safes Test Execution Service in Three Production Environments

PANORAMA Work Package 2 Final Report

Authors

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James Allsopp (University of Sheffield) – ORCID: 0000-0001-5573-3189
Chris Taylor (NHS North of England CSU, North East & North Cumbria Secure Data Environment)
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Federated Technical Development Policies

PANORAMA Supplementary Report

Katherine O'Sullivan, Astrid Dahl, Petros Kotsagiannids

SACRO in a Federated Ecosystem

PANORAMA Work Package 3 Final Report

Authors

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Petros Kotsagiannidis (University of Sheffield) – ORCID: 0009-0005-6512-7592
Diane Pallister (University of Sheffield) – ORCID: 0009-0003-6785-9418
Katherine O'Sullivan (University of Sheffield, Yorkshire & Humber Secure Data Environment) – ORCID: 0000-0002-9225-4942

Output Statistical Disclosure Control (OSDC) Principles to support Federated Analytics across Trusted Research Environments

Diane Pallister, Allison R. B. Tyler, Trupti Padiya, Vicky Campbell-Molloy, Katherine O'Sullivan

Towards Enabling Scalable Federation Solutions: Findings from the PANORAMA Early Adopter Project

Katherine O'Sullivan, Katherine Bishop, Phil Waywell, Alan Bagnall, Helen Duckworth

16 January 2026

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Challenges of being an Early Adopter

- We don't speak the same language
- Tools in active development
- There is no manual for how to make federation operational
- Experience of partners in delivering research
- Timescales of sprint programmes

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Benefits of being an Early Adopter and working with the TREvolution Team

- Incredible support from core TREvolution team
- We could shape how things work – didn't have to change established ways of working
- Outputs incorporated into ongoing programme
- Demonstrate benefits to the wider TRE community

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Public involvement and engagement

- PIE leads from across the partners
- Project underpinned by findings from a Citizens Jury
- Workshops with public groups to ensure project captured and responded to specific regional concerns

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What the public told us

- Co-design a public-facing explanation of federation
- Develop and publish trust-building protocols
- Harmonise access and governance standards
- Publish a ‘federation assurance framework’ – essential to have clear descriptions of how federation works in practice
- Create a transparency standards across a number of areas (funding, pricing models, reinvestment commitments, commercial partnerships, real-world impact and outcomes that demonstrate public benefit is realised)
- Coordination of PPIE activities across a federation – thanks to FOCUS-5

A clear need for a simple, easy to understand description of what is meant by a federated TRE network and how it will operate – it must be accurate, plain-spoken and tested for comprehension by the public/public member groups.

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PANORAMA: Key findings and benefits to the sector

Findings from PANORAMA demonstrate that we can shift from whether systems can technically connect, to how organisations prepare themselves and work together safely and consistently to maintain ongoing trustworthiness.

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Next Steps: The TREATy Framework

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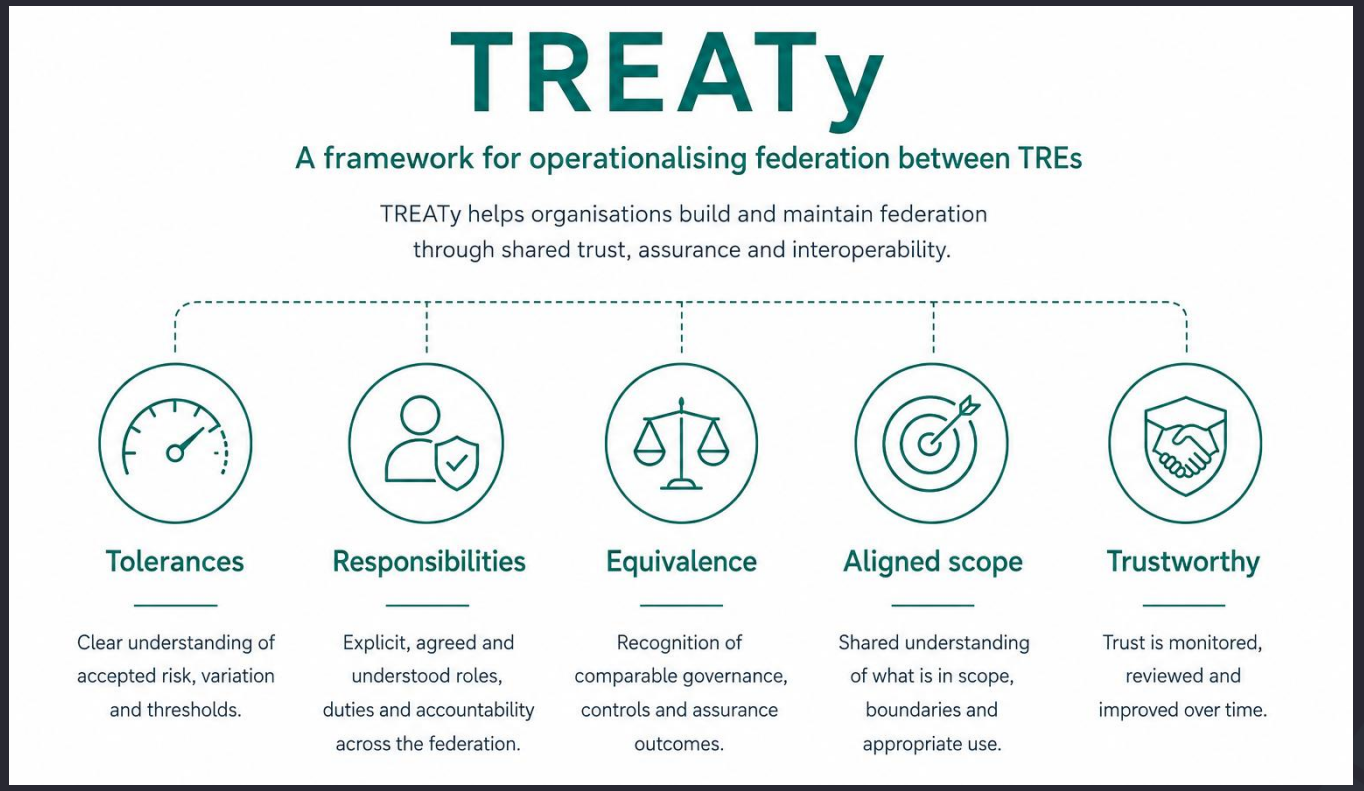

Persistent federation requires a framework to support organisations how to prepare themselves to work together safely and consistently, and how to maintain ongoing operations.

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Thanks to the project teams across the partners, our public members and the wider TREvolution core team

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Research Data Scotland

Panorama project outputs available via the QR code

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FRIDGE
In the beginning…

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Trusted Research Environments on Supercomputers

- Research needs powerful hardware
- AI in particular needs GPUs
- Leverage national supercomputing resources for sensitive data
- Supercomputers are not TREs
- How do we use supercomputers for trusted research?

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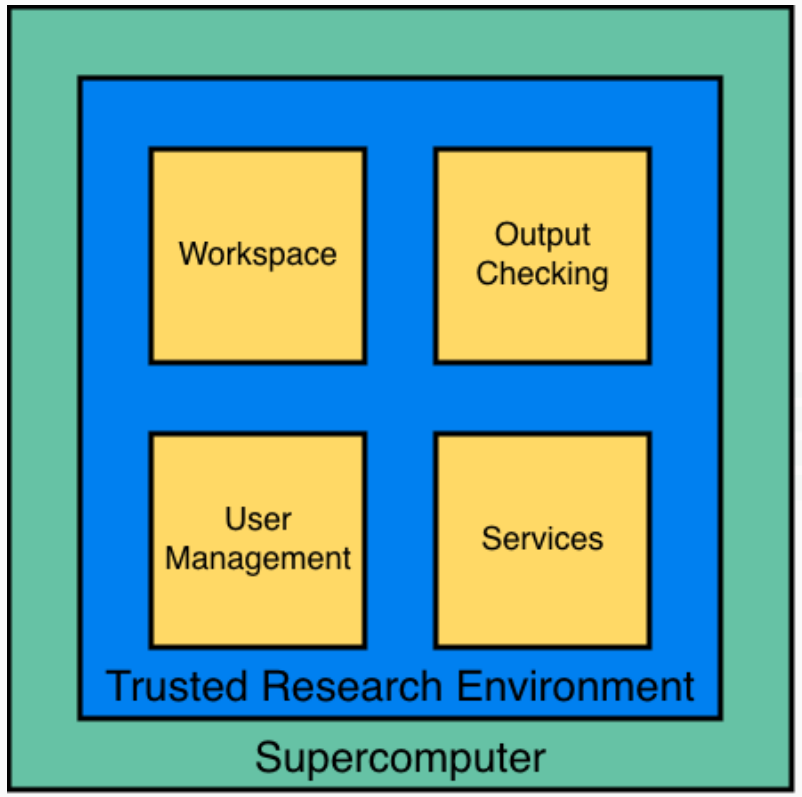
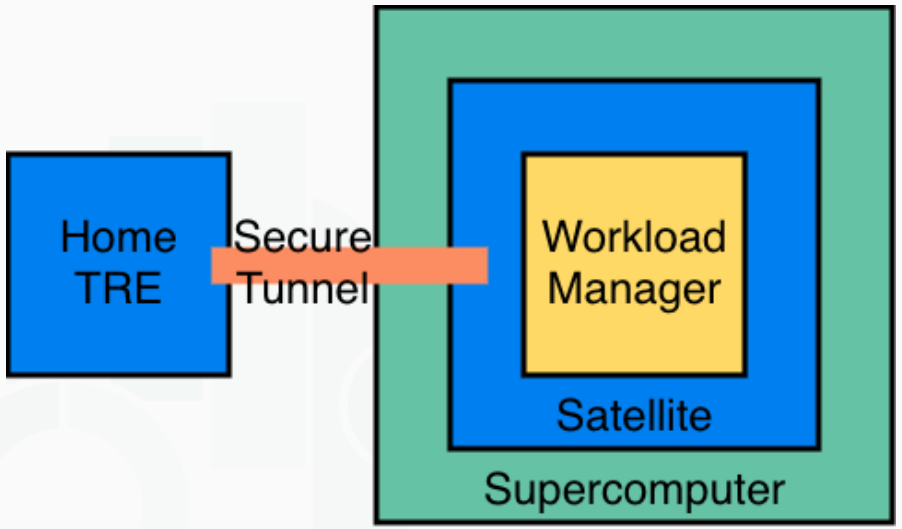
FRIDGE
Designing FRIDGE

Full Stack



Lightweight Satellite



Satellite was the clear choice for FRIDGE

- Minimal component to exploit HPC
- Small footprint (resources and governance)
- Shared responsibility as a model of federation
- Feed into the SATRE federation pillar

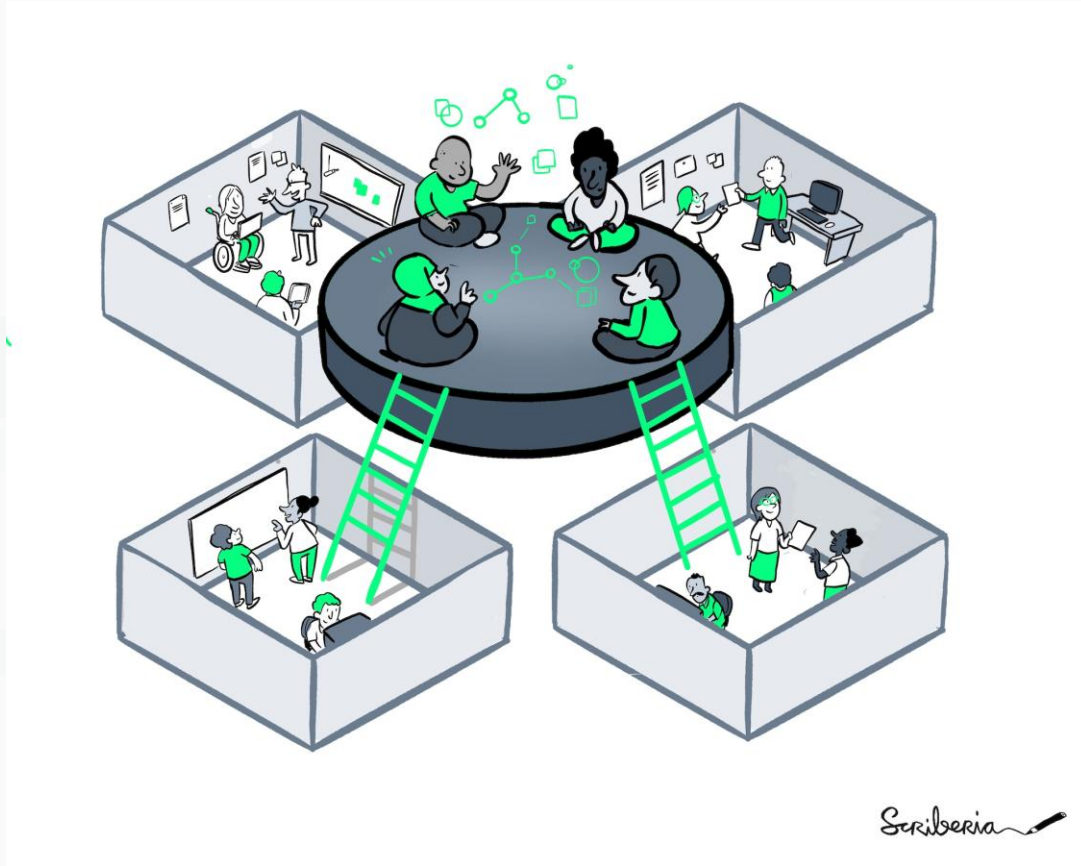
FRIDGE
Knowledge Sharing and Common Approaches

K8TRE and FRIDGE are built on Kubernetes
DIRECTOR can manage Kubernetes applications
Regular technical workshops prevented duplication and maximised compatibility

- DIRECTOR-MESH as the gateway to FRIDGE
- Format to distribute Kubernetes apps

FRIDGE's focus on Kubernetes security helped to harden K8TRE

- Limiting user privileges
- Blocking non-essential network traffic



The Turing Way Community. This illustration is created by Scriberia with The Turing Way community, used under a CC-BY 4.0 licence. 10.5281/zenodo.3332807

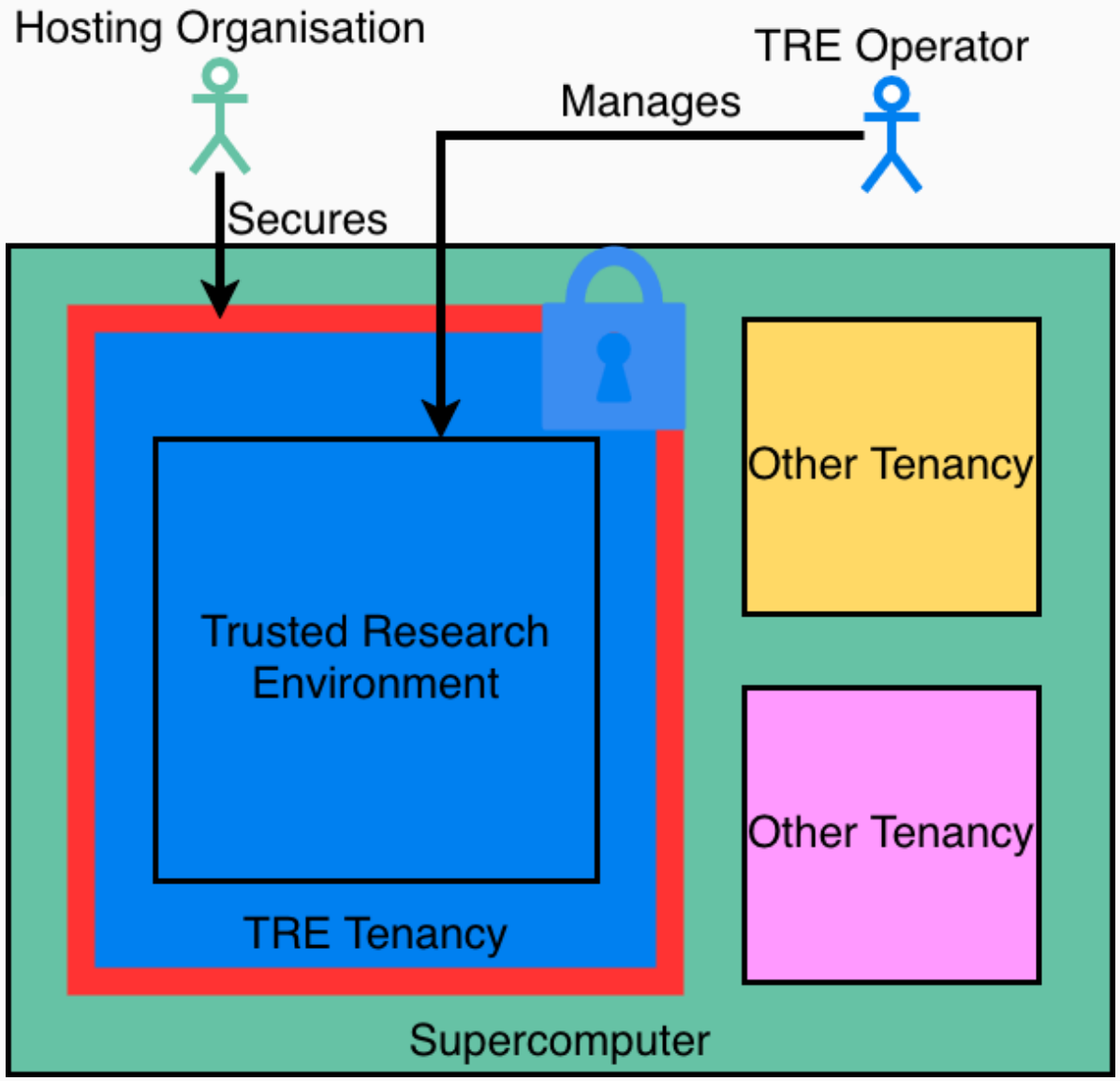
FRIDGE
TRE Tenancy

- K8TRE: one organisation controls the infrastructure and TRE
- FRIDGE: split between two organisations

FRIDGE must isolate TRE from other tenants and the host

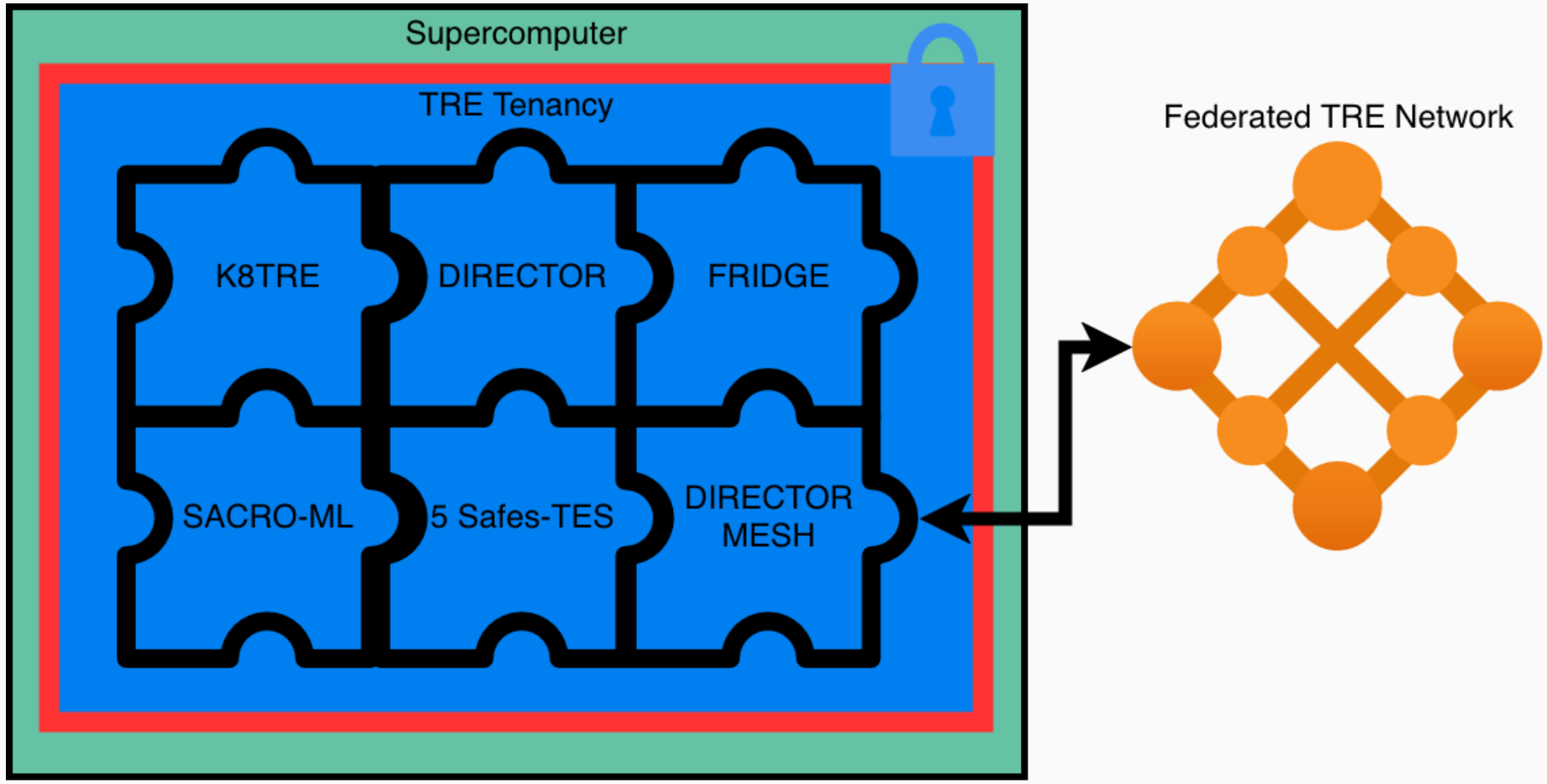
What is a TRE Tenancy?

- Secure area, housing K8s
- Network isolation and data encryption controlled TRE operator
- Defined by a set of requirements
- Enforced at infrastructure level



FRIDGE
Unlocking the potential of the tenancy

TRE tenancy as a secure container for the whole ecosystem of modular TREvolution components



FRIDGE
Moving towards production

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FRIDGE

- Implemented on Dawn and Isambard-AI
- Proved shared responsibility model
- Open code, documentation and governance
- Interest from NHS SDE Network
- Highlighted in government's AI for Science Strategy report

BriCS

DAWN

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AIRR-BRIDGE

- Large-scale AI workloads
- Large, real-world health data
- Incorporating SACRO-ML
- Progressing towards production

AI CENTRE for Value Based Healthcare

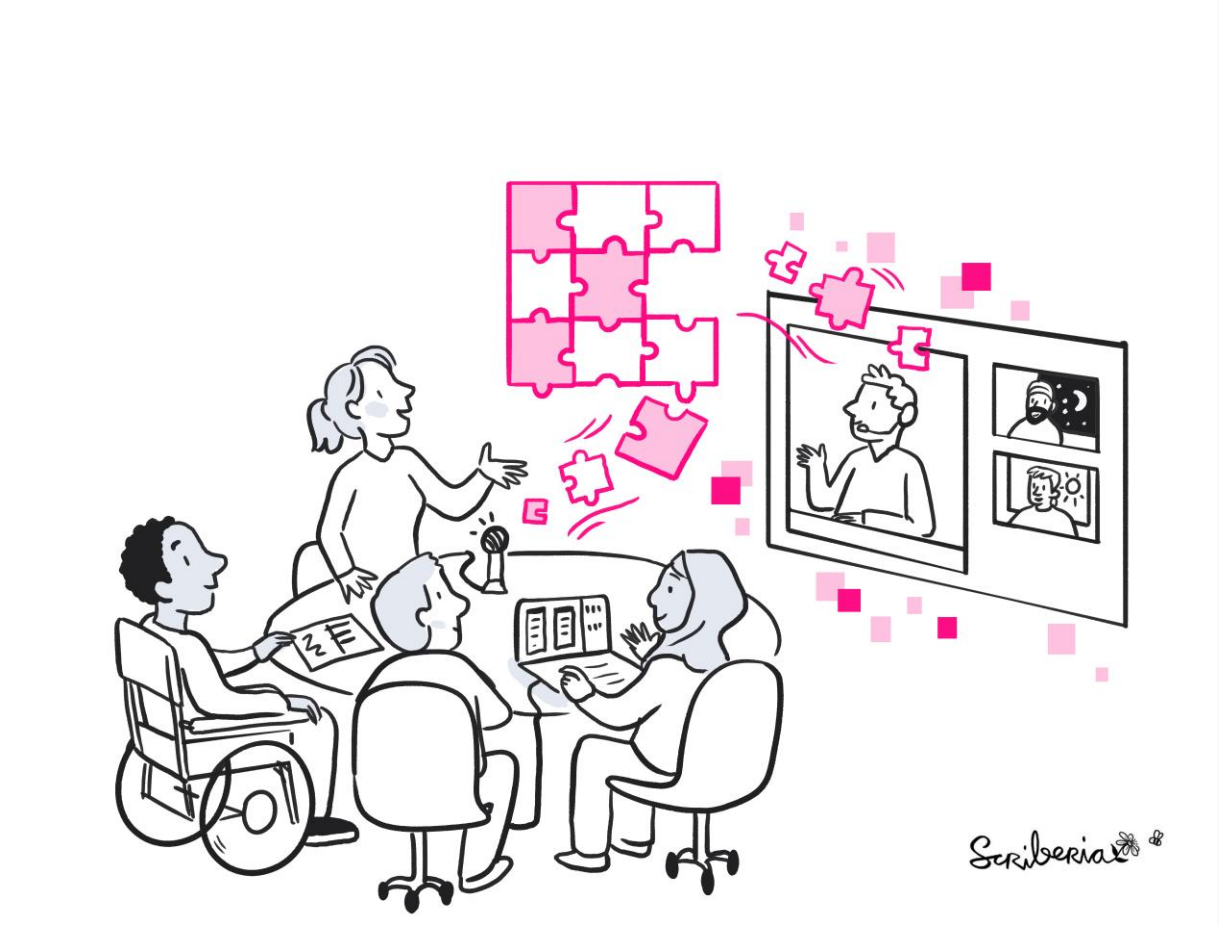
uk biobank Enabling scientific discoveries that improve human health

KING'S College LONDON

PharosAI

FRIDGE
Public Involvement and Engagement

- The plan
  - Leverage existing PIE groups
  - Relationship building
  - Upskill the public and team
- In reality…
- What did we learn?



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FOCUS-5: Creating an auditing framework for federated analysis

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Becca Wilson, University of Liverpool
DARE UK webinar, 30th July 2026

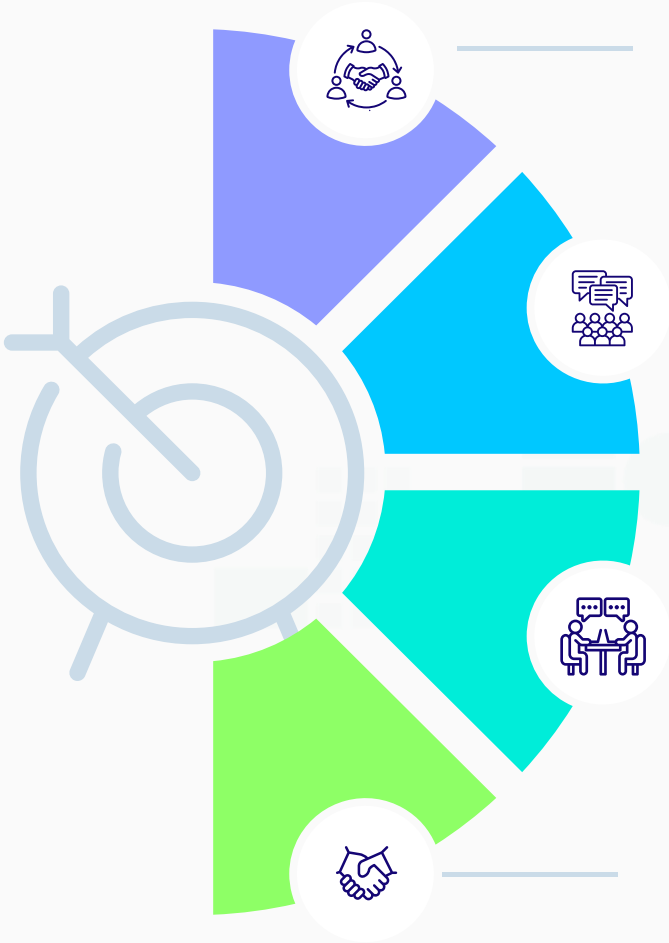
University of Liverpool, NHS Secure Data Environments (SDEs) via Lancashire Teaching Hospitals and University Hospital Southampton, SMEs, public contributors.

Test the feasibility of RO-Crates to help track, audit, and support federated analysis.

It is important that patients and data custodians know that data is handled responsibly and in line with legal and ethical standards.

Application and enhancement of RO-Crates for NHS England SDEs and federated analysis via established tools like DataSHIELD.

FOCUS-5: How did we collaborate



Collaboration

Patient engagement and technical professionals from DataSHIELD, NHS Secure Data Environment (SDE) network, DARE UK Early Adopter Projects and Community Interest Groups worked together across organisations and geographical regions.

Stakeholder input

Ongoing feedback from diverse groups, including non-expert contributors feeding into co-design via: workshops and discussion groups, community language survey, software testing and evaluation.

Co-design approach

In our collaboration: test 5 Safes RO Crate standard > identify and address gaps with new tools (CR8TOR, rocrateR, dsROCrate) > feedback to TREvolution > integrate systems RO-Crates + K8TRE + SDE + DataSHIELD.

Increase trust and transparency

First cross-SDE federated analysis in August 2025.
Improved interoperability and adoptability of RO-Crates.

FOCUS 5: An ecosystem to facilitate adoption of RO-Crates in NHS SDEs and federated analysis tools

DARE UK EARLY ADOPTERS

Five Safes RO-Crates

Feedback from FOCUS-5 requested expansion beyond workflow-based analysis to facilitate broader federated analytic compliance and adoption of RO-Crates.

rocrateR

R package to create, read and manage RO-crates. Includes utilities for metadata generation, entity management, validation and reading existing RO-Crates.

CR8TOR

Uses Five Safes RO-Crates alongside additional standards to operationalise governance and infrastructure in SDEs.

dsROCrate

Captures federated analysis provenance during DataSHIELD analysis aligned to the Five Safes Framework.

Scan the QR code to watch these tools in action

https://bit.ly/focus-5

UK Research and Innovation · HDRUK Health Data Research UK · ADRUK Data-driven change · University of Liverpool · NHS Lancashire Teaching Hospitals NHS Foundation Trust · NHS University Hospital Southampton NHS Foundation Trust · DataSHIELD Secure Bioscience Collaboration

FOCUS-5: Key learning and feedback

01 **Lack of clarity in TREvolution when projects started**
K8TRE and other capabilities were not fully defined and were still under development.

02 **Discovered gaps in the RO-Crates tool ecosystem**
No R package to build or manage RO-Crates. Adoption in SDEs needed additional tools to operationalise governance and infrastructure. We filled the gap.

03 **Limitations of Five Safes RO-Crates (5SROC)**
Difficulty meeting real-world needs: unable to capture all metadata for SDE provenance, only applicable to workflow-based analysis, no mapping of items to the Five Safes categories. Upcoming v.0.5 addresses these limitations.

04 **Communication is more complex than expected**
Significant variation in how “federation” is understood in different professional communities. Need for standard definitions and clearer messaging.

05 **Trust and transparency**
Stakeholder engagement: concerns data might be “moving” between environments. Reinforced the need to build a standards based federated analysis auditing framework

06 **Interoperability and scaling with RO-Crates**
Demonstrated scalable deployment of Five Safes–compliant federated projects (CR8TOR) with auditability of DataSHIELD federated analysis (dsROCrate).

FOCUS-5: Impact

Improvements in transparency, auditing & collaboration during federated analysis

Successful application of RO-Crates in SDE -DataSHIELD

Identifying what was needed to make it work in practice.

An ecosystem to support the adoption of RO-Crates

Made open source tools (CR8TOR, dsROCrate, rocrateR) to support RO-Crates adoption in SDEs and federated analysis software.

Improved interoperability

Previously unconnected systems were integrated: RO-Crates + K8TRE + SDE + DataSHIELD.

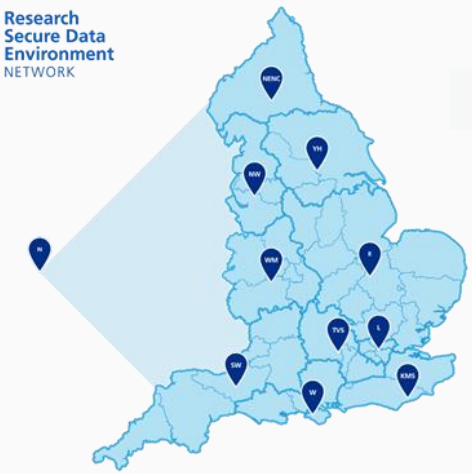
Improved trust, transparency & reproducibility

Provides a clear record of where data comes from, how it is used, and how federated analysis is carried out.

Facilitates audit in Federated Analysis

Applies established data governance principles to federated analysis for consistent auditing across organisations.

Building on FOCUS-5: A Federated North



Secure Data Environments:

N	NHS England
E	Eastern
KMS	Kent, Medway & Sussex
L	London
NENC	North East and North Cumbria
NW	North West
SW	South West
TVS	Thames Valley & Surrey
W	Wessex
WM	West Midlands
YH	Yorkshire & Humber

- Continued stakeholder engagement nationally and internationally: academia, healthcare professionals, industry and the public
- Integrating SACRO's Statbarn framework to describe the risks and existing statistical mitigations within DataSHIELDs automated output checking
- Under dev: web dashboard to display auditing info including RO-Crates from DataSHIELD federated analyses
- Advocating for wider adoption of RO-Crates and Statbarn framework in federated analysis tools and DataSHIELD community. Integral part of SDE-DataSHIELD adoption
- Investigating how other privacy methods in DataSHIELD e.g. differential privacy can be included to safely integrate other federated learning and AI tools like flower.ai in DataSHIELD