One London

Connecting a Region to Achieve Population Health

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Connecting a Region to Achieve Population Health

- Background
- east London Patient Record
- Clinical Improvement
- Population Health
- London Offer
Health and care services have five core uses of individuals’ data that need to be supported

• **Individual care (real time data sharing)**
  - Health and care professionals will be able to access an individual’s integrated care record, to support the delivery of care by having visibility of the care being delivered in other NHS and partner organisations, making use of clinical decision support systems, and to enrol individuals into prevention and health coaching initiatives as appropriate. Empowering patients to interact directly with their care record and make their own contributions. As personal health records develop, patients will also be able to add to their records using mobile devices and wearables, for example.

• **Individual care (near real-time data sharing)**
  - Support care planning for individuals by optimising how they are directed through health and social care services along the agreed care pathway and to support care coordination.

• **Intelligence (near real-time data availability)**
  - Monitor the effectiveness of healthcare delivery and support the operation of the health and care system.

• **Intelligence (longer term studies)**
  - Review health and care service provision, identifying relevant population cohorts to reduce health inequality and gaps in care, design new risk stratification approaches, and identify future population care needs and services.

• **Research (longer term studies)**
  - Identify cohorts of individuals to support clinical research, support clinical trials and health surveillance studies, and undertake retrospective data studies.
Policy & National Context

Accountable Care (FYFV Oct 14 & Mar 17)
- Provider Collaborative
- Population (Health, Care & Payment)

Industrial Strategy (Sept 17)
- Regional data sharing hubs of 3m to 5m pop (3 to 5 off)
  - Research
  - Service Improvement
  - Clinical improvement
  - Planning/Payment Reform

National Institute of Health Research (Nov 17)
- Twelve actions to support and apply research in the NHS
  - Enhance our data infrastructure

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east London Patient Record (eLPR)
Local Geography for Discovery East London – Phases I / II

Key

- Boroughs covered by Transforming Services Together (TST)
- Remaining boroughs covered by the Sustainability and Transformation Plan (STP)

Boroughs in the NE London Footprint
1. City of London
2. Tower Hamlets
3. Newham
4. Waltham Forest
5. Hackney
6. Redbridge
7. Barking & Dagenham
8. Havering

Hospitals with A&Es in the TST boroughs
H1. The Royal London Hospital
H2. Newham University Hospital
H3. Whipps Cross University Hospital

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Local Context & Background – eLPR & HIE

Discovery East London exists as part of the systems infrastructure served by the east London Patient Record (eLPR), which shares ‘read only’ patient records across health and community organisations in the five London boroughs of Waltham Forest, Newham, Tower Hamlets, Hackney and City of London, as well as with GPs in West Essex.

The Health Information Exchange (HIE) facilitates continuous improvement in the delivery of direct patient care.

Discovery supports this aim and is built into the timeline from 2017 onwards.
East London Patient Record – Live Links

- St Josephs Hospice
- Hackney Social Care
- Homerton University Hospital and Community
- C&H GPs
- OOH C&H TH
- WEL GPs
- Newham & Tower Hamlets CHS Emis Web Community
- 111/Urgent Care & LAS
- Waltham Forest Social Care
- East London Foundation Trust
- North East London Foundation Trust
- Newham Social Care
- West Essex GPs

RED=In Development
eLPR Usage
eLPR Usage
74% stated patient experience improved with regards to accessing history.

80% stated patients were pleased clinicians can access information such as blood test results, hospital appointments, etc., saving DNAs.

Ward pharmacists no longer phone practices to reconcile medicines on admission, saving an hour a day EACH.

74% stated their confidence in patient safety increased; 63% saying patients felt more confident.

Quantified Benefits


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LDRs - Maturity

LEVEL 0
Ambition for information sharing approach at place but no programme

LEVEL 2
Limited information sharing approach at place as only between limited settings and limited functionality e.g. only access to GP records via MIG to Acutes.

LEVEL 1
Programme in place but no information sharing approach at place in operational delivery (i.e. early pilots/thoughts only)

LEVEL 3
Mature information sharing approach in place across multiple care settings e.g. Acute, Social Care, Communities

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east London Patient Record (eLPR)

- Full ELHCP Coverage - 2m population
- Pan London Connection
- Beyond West Essex
- Significant Benefit
- Cost <£1 per head per year
- Benefit >£3 per head per year

TRUST
Clinical Effectiveness Group (CEG)
East London Practices – Exceptional QOF success: Example trajectory of change – City & Hackney

2017 Figures: City & Hackney, Newham & Tower Hamlets 1st, 2nd or 3rd in 25% QOF metrics

Special mention for Newham at 2nd for AF coag without exceptions and City & Hackney at 1st for AF coag with exceptions

Waltham Forest commissioned work with CEG

C&H 2013
- 21st COPD FEV1
- 41st AF anticoagulated
- 148th Diabetes BP
- 181st Diabetes chol

C&H 2014
- 1st AF anticoagulated *
- 1st Diabetes foot exam
- 2nd CHD BP
- 2nd Stroke BP
- * with exceptions

C&H 2015
- 1st BP target CHD, Stroke, PAD, CKD
- 1st AF anticoagulated (with exceptions)
- 1st COPD x spiro, MRC, FEV1
- 1st Asthma review
- 1st Diabetes exam
- 2nd Diabetes education
- 2nd Dementia review
- 3rd Hypn BP
- 3rd Diabetes BP

C&H 2016
- 1st AF Anticoagulated (with exceptions)
- 1st CHD BP
- 1st HYPTN BP
- 1st PVD BP
- 1st Stroke BP
- 1st Asthma 3Q
- 1st COPD Spirom
- 1st COPD MRC
- 1st COPD FEV1
- 1st Diab BP
- 1st Diab exam
- 1st Smoking advice
- 2nd Diab Chol
- 2nd Dementia
Combined View % Age ≥ 65y with pulse check in 5 years, Tower Hamlets

% Age ≥ 65y with pulse check in 5 years
Population Health Platform (Discovery)
Priority Aims of Discovery East London

To become an active contributor to the Learning Health System and a research-enabled community

• To predict, anticipate or inform individual health needs from algorithms running in real time

• Deliver insight across the whole care pathway, in primary or secondary care or elsewhere, to create opportunity for improvement and reduced adverse outcomes.

• To expand the existing population health programme in East London, led by the Clinical Effectiveness Group at Queen Mary, to all health and care sectors.

• Enable real time reporting on programmes by providers and commissioners supporting clinical improvement and new payment mechanisms for value-based improvement. This reports on either pseudonymised or identifiable cuts of clinical data, as appropriate.

• Third party use by commissioners, public health, and academics to support research, development and planning, on consented identifiable data, or a pseudonymised dataset.
A Learning Health System

Informed by the learning cycle, as described in ‘Toward Complete & Sustainable Learning Systems’ by Professor Charles Friedman (2014)

- Workflow
  - Who am I consulting?
  - Discharge dates, summaries, reconcile medicines
  - Care plans
  - Patient system flows

- Visualise & Review
  - Patient apps
  - Views: eLPR
  - Record sharing
  - Virtual clinics
  - Performance dashboards
  - Real time outcomes

- Discovery
  - Efficient pathways: Cancer delay
  - Meds optimisation: Stroke reduction
  - Monitoring eGFR: CKD prevention
  - Intervention: Gestational diabetes
  - Prevention: Colorectal screening

- Improve
  - Basic science / genomics
  - Trials
  - Predictive scores
  - Child risk and drug safety
  - Targeted medicines

- Research + safety

Informed by the learning cycle, as described in ‘Toward Complete & Sustainable Learning Systems’ by Professor Charles Friedman (2014)

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Discovery Architecture

- Real-time reporting – within 12-24 hours
- Efficiency – no duplicate tests
- Efficiency – admission avoidance
- Predictive scores
- Decision support
- Research
- Patient connection
- Social services, OOH, 111 etc. ...

Endeavour & CEG

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Discovery East London – Current Projects

- **Atrial Fibrillation** *(Dr John Robson)*
  
  Routinely relate treatment to outcomes: Show that new strokes and heart attacks are higher in patients treated with aspirin than anticoagulants and even higher in patients on neither.

- **Ongoing CEG Analysis** *(Dr Kambiz Boomla)*
  
  Clinical safety, health needs assessment, quality improvement, evaluation & commissioning support.

- **Child Health** *(Prof. Carol Dezateux)*
  
  National Child Measurement data and links with local authority data

- **East London Genes & Health** *(Prof. David van Heel)*
  
  To support application and grant delivery, engagement with an Identifiable Data Safe Haven for secure, limited & managed data export and potentially to help with e-health record analysis.

- **Natural Language Processing (with Clinithink)** *(Dr Charles Gutteridge)*
  
  Incorporate Natural Language Processing (NLP) into the Discovery programme to improve the specificity of cohort identification.

- **Where is my patient & who is providing care?** *(Luke Readman)*
  
  Streamline identification of the organisations and people caring for a patient from primary, community, secondary, mental health and out of hours providers, better integrating the links between the patient and all the health and social care professionals who provide care.

- **Missed Actionable Moments in Lung Cancer Pathway** *(Group)*
  
  CRUK Award

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What Do You Do With An Idea?
*Kobi Yamanda*

The story of one brilliant idea and the child who helps to bring it into the world. As the child's confidence grows, so does the idea itself. And then, one day, something amazing happens. This is a story for anyone, at any age, who's ever had an idea that seemed a little too big, too odd, too difficult.

• Complex
• Variation
• Tribal
• Opportunity
• Excellence
• Concentration
• Willingness
A Learning Health System for London

....strive to become learning health systems by making clinical data research grade and lowering the cost of data acquisition and knowledge generation


• Every consenting patient’s characteristics and experience is available to learn from
• Best practice immediately available
• Improvement is continuous
• This happens routinely and efficiently
• This is part of a culture

Why I Like Unlocking Power of Data So Much

*Source: Matthew Syed ‘Black Box Thinking’*
Exceptional Opportunity to Leverage pan London partnerships

- 9 million Londoners
- 33 Local Authorities for London citizens plus GLA
- 5 Sustainability and Transformation Partnerships
- 3 Academic Health Science Centres and Networks
  \[\text{AHSNs relicensed as NHS ‘centrepiece for innovation’}\]
- 3 NIHR Collaborations for Leadership in Applied Health Research and Care (CLAHRCs)
- 8 Biomedical Research Centres
- 5 world leading Universities in pan London HDRUK
- Other research partners
- Smart London & other innovation tech partners

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The current state assessment example (east London), considered against the future operating model for population health analytics.

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One London Focus

The ‘LHCRE’ programme is a way of building on existing progress to support a city-wide infrastructure that is coherent, coordinated and greater than the sum of its parts

- This is not about ‘Digital’ for its own sake, it is about the technology that enables STPs to deliver their ambitions for service transformation: integration and population health management

- It is a ‘One London’ approach, not a ‘Once for London’ approach. This means that STPs are collaborating to share knowledge and to ensure consistency – e.g. developing and using the same standards rather than being required to use the same systems

- Where action is best undertaken together – like organising a conversation about information sharing with all Londoners – we will coordinate our efforts, but in all aspects the programme is for, and delivered by, STP areas

- LHCRE is not a new system to layer on top of existing investments; it is a process to work together to link what STPs have already developed, and to speed development of systems where there are gaps

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Six Core Features of One London LHCRE

1. Extend and build upon a single approach to record sharing via federated exchange mechanisms both within STP footprints and pan London

2. Distributed actionable data service (in real time, linked, normalised, common information model) for 9M Londoners, plus those outside London where treatment is delivered via London providers.

3. Exploit significant opportunities to enable active patient participation by linking them to their data and providing an app ecosystem

4. Utilities that use the data service to provide population health and business intelligence (information service for a single version of the data)

5. To develop London-wide governance of trusted local clinical improvement methodology

6. To provide a single data approach for research pan London

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One London – Demonstrator Projects

• Pan London emergency care with frailty alerting
• End of life & embed Coordinate My Care (provide clinical data interop)
• LTCs: Identification & management (Illustration: atrial fibrillation)
• Care Home Access & communication
• Population health analytics – WSIC functionality (sharing diabetes IP)
• Roll-out of IMPARTS – mind & body interface
• Digitally engaged Londoners & self management with PHR
One London LHCRE – Demonstrator Projects (Egs.)

Better health for older people living in nursing and residential care homes: enhancing access to electronic health records at the point of residential health care delivery

The problem
More than 300,000 older people live in care homes in England, most with complex physical and mental health needs. Their health care is often fragmented, reactive, lacking in continuity, and varying in quality. Care home residents have higher than average unplanned hospital admissions.

Proposed approach
We will deliver an integrated electronic health record system, accessible at the point of delivery of residential health care
We will pilot access to by care home staff to their residents’ primary care health records, enabling staff to annotate the record and to access quality improvement dashboards to optimise medicines management, annual reviews and anticipatory care (including flu vaccination).

Who will benefit
Clinicians will be able to access records at the point of residential care, and enter and record data without duplication on paper records
Residents will be able to ensure their wishes in respect of urgent and emergency care and end of life care, including for resuscitation, can be accessed and respected by health care professionals involved in their care irrespective of geographies or setting.

Where
South West and North East London initially

Impact
Delivers framework for enhanced health in care homes co-developed from NHS England vanguard sites
Supports CQC standards for care homes
Supports NICE guidelines: Managing medicines in Care Homes; Older People with Social Care Needs and Multiple LTCs

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One London LHCRE – Demonstrator Projects (Egs.)

1. **CALL 111**
   - **START:**
     - Caller dials 111

2. **NHS 111 / Frailty Flag**
   - Call Handler receives call and checks patient demographics against the spine to derive NHS number

3. **PRM Searches for data sources with validated NHS Number**

4. **PRM Checks NHS Number against Endeavor Discovery dataset for 1 or more flag / Triggers (Must flag for frailty) to alert additional information is available**

5. **If a flag is present, the call is passed to a Clinician for their additional SME input**

6. **Information is passed back to call handler**

7. **If a flag is not returned, the call handler can continue the call as normal**

**Flags**

<table>
<thead>
<tr>
<th>Flags</th>
<th>NEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - Enable a trigger based on a Severe frailty.</td>
<td>Core</td>
</tr>
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**NEC data flagging via Discovery**

**Endeavour Health Charitable Trust**

**Information is passed back to call handler**

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One London LHCRE – Demonstrator Projects (Egs.)

Atrial fibrillation: Detect and protect to prevent stroke

The problem
100,000 people in London have atrial fibrillation (AF) causing 1 in 6 of all strokes; 1 in 3 over age 80. Treatment reduces stroke by at least 64% but 1 in 5 people with AF receive suboptimal treatment. We aim to make London a city of international excellence for AF detection, management and stroke prevention – to match London’s international pre-eminence in acute stroke care.

Proposed approach
Detect: Earlier detection of AF is simply achieved by routine pulse regularity checks every 5 years in people over age over 65 years. New AliveCor hand held ECG devices implemented across London improves efficiency.

Protect: Improved management of AF:
• End obsolete aspirin monotherapy and use appropriate anticoagulants
• Optimise blood pressure control and statin use.
These are achievable by digitally enhanced support for general practitioners and further enhanced by in-practice clinical pharmacists.

Who will benefit
Detect: In London, pulse regularity checks will increase new cases by 4000 within 2 years

Protect: Increased AF anticoagulation and risk factor control by 10%.
    An additional 8000 people each year will be better protected.

Together detection and anticoagulation will reduce stroke in London by 250 every year - equivalent to preventing all of the strokes in one London Borough.

Where
All 5 London STPs have elements of these programmes which can be further enhanced with digital and better aligned support – digital visibility of London performance trends is a key objective.

Impact
Create an internationally relevant step change in optimal care. Supported by: NICE guidance, Atrial Fibrillation Association, British Heart Foundation, Stroke Association, AHSNs across London (Pan-London AF toolkit) and NHS Innovation for technology transfer and new medicines.
Proposed LHCRE Technical Architecture

Common Services
- DCC
- ISA
- Privacy Preferences
- Policy Decision Engine

Security
- Identity Management
- Business Rules Engine

Authorization API
- Business Rules Checks

STP HCR Information providers (Federated LSP Instances)
- Data Stores
- Dashboards
- Analytics
- Care Records
- Subscriptions
- Information Model
- Normalized data Layer

Data Transformation
- REST
- WebServices
- Routing

Data Integration Layer
- SFTP
- Adapters
- Secure Communication
- MILLP/TCP-JP
- MQ

Documents
- Data

Provider Systems
- HCR View
- HCR Data

London Federated HIE's

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National and Non-London Services
- NLRS
- eRS
- Spine (SCR)
- Non—London STP's

Regional Services
- London Ambulance Service
- NEL CSU DSCRO

SMART on FHIR

PHR(S)

Apps

CMC
LHCRE, HDR & DIH Infrastructure & Requirements

Health & Care Data

- Electronic Health Records
- Imaging Pathology Records
- Mobile and wearables
- Local Authority/Social Care Records

Innovation requirement eg NLP/AI/ML/Wearables/PROMs

- HPC Safe Haven Research Environment
- Clinical Apps
- Research Apps
- Federated Access

- Local Safe Haven
- Clinical Apps
- Research Apps
- Federated Access

- Virtual Cohorts
- Clinical Apps
- Research Apps
- Federated Access

[RI 3] Trials
[RI 4] Public Health

[RI 2] Precision Medicine
[RI 1] Actionable Analytics

Genomics and multi-omics with consent

Research requirement eg access to multimodal data inc EHRs

HES, PHE, GLA etc anonymised data

Wider environment "Exposome"

Linked datasets

Governance
- PPI, NHS Trust, GP, LA havens with opt-out

Data
- Health, LA & Social Care

Infrastructure
- Federated
- Local safe

LHCRE

DIH

HDR

Informed consent

Research subjects

Omics

High Performance Computing Safe Haven

Data sharing
between hospitals

Small scale 2ndary clinical

National audit with opt-out

Large scale National Datasets

Single safe haven

Single safe haven
One London LHCRE - Governance

- Embedded within the wider London devolution governance
- MOUs govern the funding transfer to London, and through to STPs, in return for commitment to delivery objectives
- A dedicated SRO, with working groups and a dedicated Digital Architecture Authority
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Conclusions

• We are a complex city but we offer a unique opportunity, and we need some help to be better than the sum of our parts

• The LHCRE process is itself helping us to collaborate and converge, focusing on what local systems are saying they need, and helping them to understand what is required for population health management

• Whilst we are converging on some technical architecture, this is really about developing a different type of collaborative leadership around digital

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