MRC Health and Biomedical Informatics Research Strategy

NHS-HE Forum
25th May 2016

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Head of Informatics Research
Medical Research in the ‘Big Data’ Era

• Vast amount of biomedical and population data
  • Population and clinical studies
  • High-throughput technologies – ‘-omics’
  • Imaging
  • Health records
  • Administrative data
  • Other data – loyalty cards, mobile phones, digital apps and fitness sensors, social networks etc

• Opportunity – new scientific discoveries from large-scale data on a scope and scale not previously possible

• Challenge – to create necessary infrastructure, resources, capacity, legal and regulatory frameworks to realise opportunity
MRC’s vision for informatics

...to harness the vast sources of complex biological, clinical, population and environmental research and routine data to gain new scientific insights and advance patient and public health

- Supporting future **scientific needs**
- Enabling **technologies, tools and infrastructure**
- Building **capacity** in strategically important quantitative **skills**
- Developing **trusted research environments**
- Promoting **policies** that encourage data sharing and access
Medical Informatics Landscape

The Farr Institute of Health Informatics Research

23 academic institutions
2 MRC Units

CIPHER
London
HeRC
Scotland

Medical Bioinformatics
Leeds
Imperial
Oxford
UCL-Crick-EBI
Warwick/Swansea
Uganda

NIHR - HIC

NIH Big Data to Knowledge (BD2K)

Global Alliance for Genomics & Health
>£100m MRC Investment in Health & Biomedical Informatics Infrastructure

**MRC Medical Bioinformatics**

- Leeds
- Oxford

**Warwick-Swansea**
- Cardiff
- PHE Wales
- Birmingham

**UCL (eMedLab)**
- EMBL-EBI
- Sanger
- KCL
- Crick
- LSHTM
- QMUL

**Imperial**
- EMBL-EBI
- Cambridge
- Nottingham
- Oxford
- Farr@Swansea

**Uganda**
- Sanger
- Cambridge
- Oxford

**Farr@Scotland**
- Aberdeen
- Dundee
- St Andrews
- **Edinburgh**
- Strathclyde
- Glasgow
- Leicester

**Farr@HeRC**
- Newcastle
- Lancaster
- York
- Bradford
- **Manchester**
- Liverpool
- Sheffield

**Farr@CIPHER**
- Swansea
- Cardiff
- Welsh Gov
- Bristol
- Brighton
- Exeter
- Surrey
- Oxford

**Farr@London**
- UCL
- Sanger
- KCL
- LSHTM
- QMUL
- Crick
- LSHTM
- QMUL
- HPA
- MRC CTU
Building on existing infrastructure: Farr Institute & Medical Bioinformatics Awards

- ~80 PhD students
- MSc Courses - Health Informatics, Data Science and Medical Bioinformatics
- Early Career Fellowships
- Short courses and CPD
- On line distance learning courses
- Training modules for undergraduates

- Epidemiology
- Efficient trials
- Genetics and genomics
- Citizen driven health (apps / wearables)
- Learning health systems

- Machine-learning
- Text mining
- Imaging informatics
- Visualisation
- Pioneering data linkage

- High performance computing
- Cloud computing
- Interdisciplinary environments/buildings
- Trusted Research Environments
- Secure data platforms e.g. UKSERP for DPUK

Skills

Infrastructure

Research

Analytical Methods & Tools
Establishing a national health and biomedical informatics research institute ("Farr 2")
Key Principles

- **Build on existing investments** – but not an exclusive club

- Institutionally agnostic

- Predicated on interdisciplinary **team science** - valuing technical services

- **Not** a data holder or owner

- Create an informatics **ecosystem**

- **Focus and scope** – quick wins & long term ambitions
Core activities

- **Leadership** – deliver a co-ordinated national programme of research
- **Skills and capacity** - develop capability and expertise in “translational” health and biomedical informatics research
- **Secure data flows** - create secure, trusted and interoperable research environments
- **Analytics, tools and standards** - generate novel analytical tools for rapid translation into use
- **Partnerships** – work with owners and controllers of data, NHS partners, academia and industry
- **Open science** - Establish an open science and open innovation approach
- **Public Trust** – advocate for use of data and public engagement
Interdisciplinary Capacity Building

Interdisciplinary “team science”
Translational medical informatics

Flexible short courses and secondments to provide data skills to domain experts

Health & biomedical expertise

Maths, statistics & computer science

Foundational maths, stats & computer science expertise:
Working with EPSRC community, e.g. ATI, HPC community....
Operational Model Principles

• Internationally-renowned, competitively appointed director

• Novel mode of operation
  • Independence, leadership, sustainability
  • Akin to an MRC Unit or Institute
  • Distributed
  • Separate legal entity

• Core (25%) & diverse consortia (75%)

• Supported in partnership with other funders
## Timeline

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- **Farr Funders Meeting**
- **Informatics alignment dinner**
- **Second Scientific Leaders Meeting**
- **MRC Council endorses establishment of Institute**
- **Competitive Director Search**
- **Establish legal entity**
- **“Start up” programmes**

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**Partnership Development/OSCHR Strategic Coordination**
Public Engagement & Trust

#DATA SAVES LIVES