East of England Clinical Senate

Assembly

21st October 2014

Jane Blower

Deputy Chief Scientific Officer (Acting) NHS England
Scientific Workforce Advisor HEEM Consultant Embryologist - Leicester Fertility Centre UHL NHS Trust.

NHS England

Diagnostics: Challenges and Opportunities in the East of England

Jane Blower
Consultant Embryologist
Deputy CSO (Acting)
21st October 2014

Presentation Outline

- HCS –who we are and where we fit into the system
- Current seven day HCS scientific diagnostic services provision
- Challenges for HCS diagnostics
- Opportunities for HCS diagnostics
- Innovative diagnostic solutions
- Delivery locations as potential solutions
- Intelligent commissioning of HCS diagnostic services
- Workforce requirement for 7 day service delivery
- Next steps

Healthcare Scientists and Scientific Services

- 55K working across some 52 specialisms/professions and in over 150 different services
- Broad range of functions from screening to diagnostics and monitoring to specialist therapeutic intervention and rehabilitation to equipment management and safety
- Deliver across most elements of care and into all 5 NHS Outcome Framework, informs 80% of all diagnoses and involved in the delivery of over 1 billion tests and investigations per annum.
- Important interface with public health services/provision
- NHS scientific services cost approx £8 billion, are mainly secondary care based. Equates to 10% of the NHS budget
- Diagnostic requests have doubled in the last 5 years

Healthcare Science Specialisms

NHS England

Laboratory (life) Sciences

- Analytical Toxicology
- Anatomical pathology
- Blood transfusion science/transplantation
- Clinical biochemistry including paediatric metabolic biochemistry
- Clinical genetics/Genetic Science
- Clinical embryology & Reproductive Science
- Clinical immunology
- Cytopathology including cervical cytology
- Electron microscopy
- External quality assurance
- Haematology
- Haemostasis and thrombosis
- Clinical Immunology
- Histocompatibility & immunogenetics
- Histopathology
- Microbiology
- Molecular pathology of acquired disease
- Phlebotomy
- Tissue banking

Physiological Sciences

- Audiology
- Autonomic neurovascular function
- Cardiac physiology
- Clinical perfusion science
- Critical care science
- Gastrointestinal physiology
- Neurophysiology
- Ophthalmic and vision science
- Respiratory physiology
- Urodynamic science
- Vascular science

Bioinformatics

- Genomics and Clinical Bioinformatics
- Health Informatics
- Pathology

Physical Sciences and Biomedical Engineering

- Biomechanical engineering
- Clinical measurement & Development
- Clinical Pharmaceutical Science
- Diagnostic radiology & MR physics
- Equipment management & clinical engineering
- Medical electronics & instrumentation
- Medical engineering design
- Clinical photography
- Nuclear medicine
- Radiation protection & monitoring
- Radiotherapy physics
- Reconstructive Science
- Rehabilitation engineering
- Renal dialysis technology
- Ultrasound & non-ionising radiation

HCS workforce across whole healthcare system in NHS, PHE and National Blood and Transplant Service

They have multiple impacts on all patient pathways through the specialist diagnostic, therapeutic and equipment services they provide.

Diagnostics at the heart of patient care

- Pathology, Very few diagnoses of cancer are made without pathology input, a role deciding the appropriate treatment for individual patients.
- Vascular services improve outcomes and recovery of stroke patients
- Genetic testing Determine the cause and pattern of inheritance monitoring or intervention to avoid premature death
- Long term condition management of diabetes, neurological conditions
- Respiratory scientists – Management of COPD,
- Medical Physics & Clinical engineering -ensure critical equipment needed for patient care functions safely and effectively.
- Radiotherapy physics: maintaining the precision and accuracy of radiation treatments for cancer
- Cardiac scientists –support cardiovascular services

Healthcare Scientists Example of the Contribution to Cancer Care

NHS England

Prevention / Screening	Diagnosis	Treatment	Ongoing management / monitoring	End of Life Care
• Providing screening programme services • Faecal occult blood detection • Cervical cytology • Analysis of patients and families for genetic components of or predisposition to cancer • Quality assurance of mammography equipment • Development and introduction of new digital mammography	• Definitive diagnosis of a range of solid tumours – increasingly responsible for tissue receipt, cut up and preparation of slides • Developing, performing and interpreting specific molecular tests targeted at specific cancer loci • Development and validation of Nuclear medicine tests • Quality assurance and optimisation of all imaging techniques used in cancer pathways	• Assessment of impact of radiotherapy and/or surgery through measurement of biomarkers • Assessing physiological function • Specific diagnostic testing to assess minimal residual disease in leukaemia • Staging and planning Radiotherapy treatment • Implementing and evaluating new radiotherapy techniques - IMRT, IGRT, tomotherapy • Fitness for surgery/ measurement of prognostic indicators and post operative support • Production of specific prostheses for reconstructive surgery	• Monitoring patients in remission for early evidence of recurrence • Selection of breast cancer patients suitable for Herceptin therapy • Monitoring ongoing physiological effects of cytotoxic therapy	• Managing the immediate consequences of death • Post mortem examinations • Bereavement care of relatives

NHS Everyday –HCS Diagnostic services

Assessment and treatment of transient ischaemic attack (TIA)

Investigating and treating high-risk patients with TIA within 24 hours could produce an 80 per cent reduction in the number of people who go on to have a full stroke.

Treatment of infertility patients with over seven days

Improves outcomes and can be used to reduce multiple pregnancies

Microbiology services

Earlier treatment and a reduction in spread of infection. Resulting in better recovery and reduced LOS. MRSA and C diff reduction

Cardiology diagnostics

Angiogram and angioplasty –reducing wait and duplication. Trust collaborative

Respiratory services

Improved outcomes and earlier discharge

Clinical Standard 5 diagnostics

- Hospital inpatients must have scheduled seven-day access to diagnostic services such as x-ray, ultrasound, computerised tomography (CT), magnetic resonance imaging (MRI), echocardiography, endoscopy, bronchoscopy and pathology. Consultant-directed diagnostic tests and completed reporting will be available seven days a week:

• Within 1 hour for critical patients

• Within 12 hours for urgent patients

• Within 24 hours for non-urgent patients

- **Supporting information:** It is expected that all hospitals have access to radiology, haematology, biochemistry, microbiology and histopathology Critical patients are considered those for whom the test will alter their management at the time; urgent patients are considered those for whom the test will alter their management but not necessarily that day.

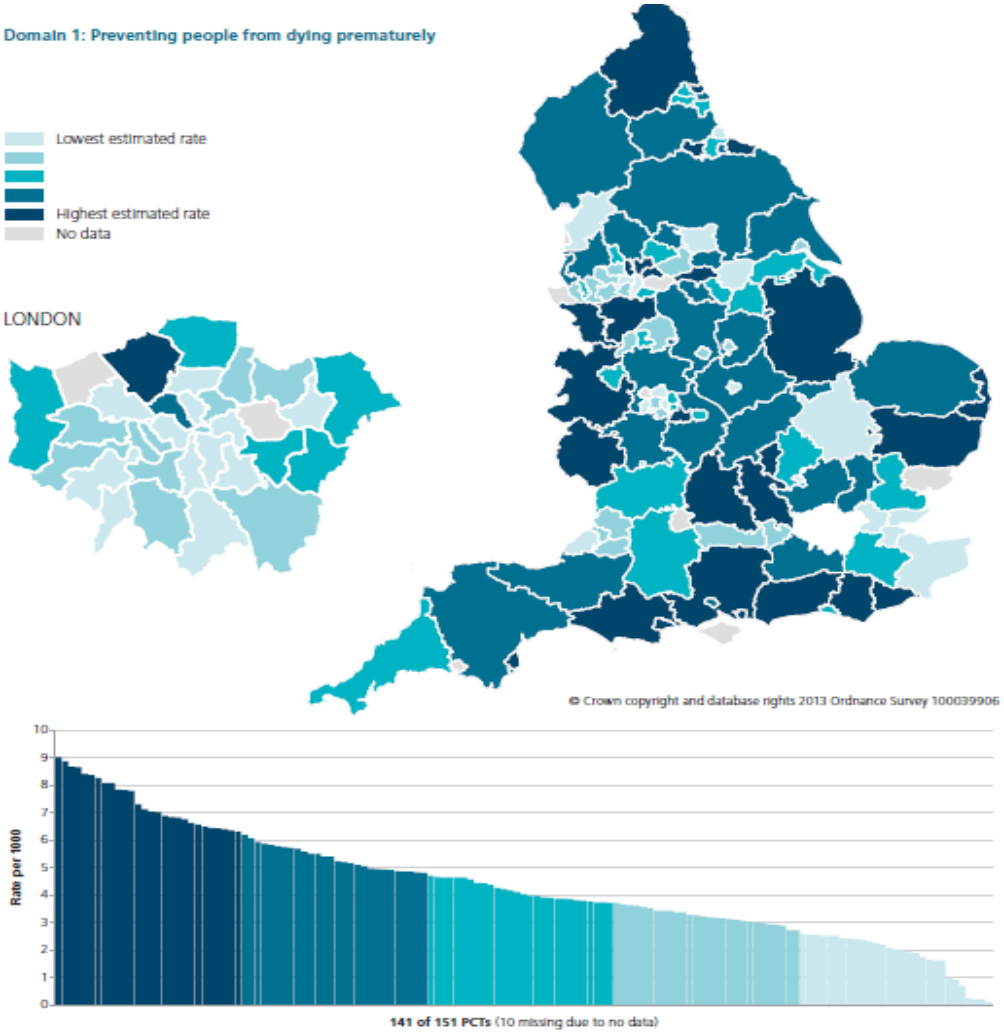
Meeting the challenge: Right time right place diagnostics

- To deliver appropriate, high-quality, cost effective diagnostics co-ordinated across primary and secondary care
- Value for money and efficiency
- Admission prevention
- Accessibility and equity of access
- Reduction in duplication of diagnostics
- Holistic care
- Improve pathways by reconfiguration
- Quality and patient safety
- Access to expert advice and information for patients, providers and commissioners

7 Day service Challenges for HCS diagnostics

- Emergency vs elective diagnostics. Focus on urgent and emergency care –for some diagnostics it may be more effective to deliver services over 7 days
- Commissioning of diagnostics –tied into block contracts
- Variation of service provision –Atlas of variation
- Small disciplines with small workforce Workforce challenges – ensuring appropriate skill mix
- Point of care testing
- Diagnostics and primary care
- Patient input –what do patients want? HCS 7 day service national survey results

Equity of access to scientific diagnostics



Variation in Physiological diagnostics

Test	Variation	After exclusions
Audiology assessments *	11x	5x
New born hearing tests ᵒ	4x	2.5x
Sleep studies *	79x	23x
COPD patients with FEV recorded #	1.3x	1.2x
Urodynamic tests *	144x	23x
Electrocardiography *	34x	4x
Diagnostic invasive electrophysiology *	*n/a*	829x
Peripheral neurophysiology *	124x	37x

* national data collected monthly since 2008
# from GP database (QoF) data
O from National Screening Programme data

Quality, Safety and assurance

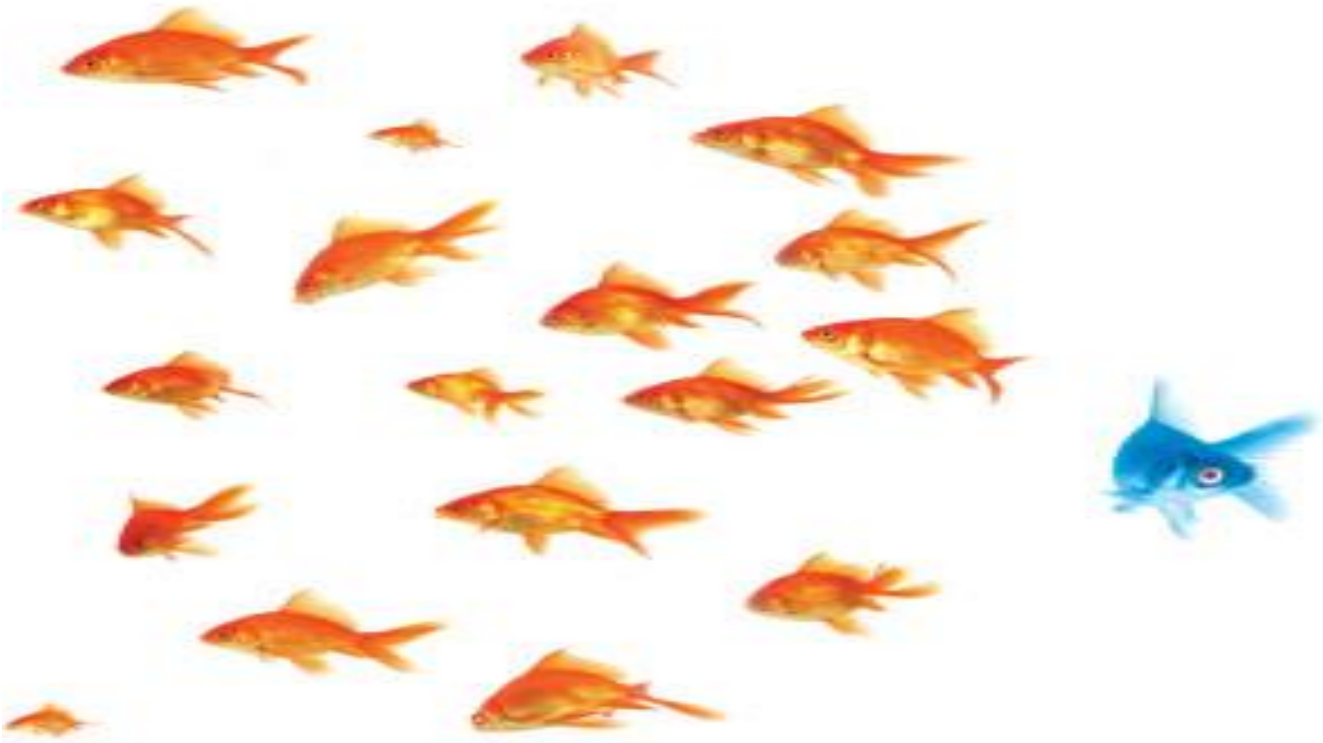
- System wide focus on service quality and assurance
- Berwick report focus on safety
- Keogh & Barnes report look at systemic issues
- Atlas of variation asks important questions about qua
- Scientific services have led the way with service accreditation such as:
- IQIPS -Improving Quality in Physiological Services, hosted by RCP and
- Medical Engineering & Physical Sciences – Improving Clinical Engineering and Physical Scientific Services iCEPSS
- CQC: Hospital inspections will be informed by accreditation schemes

CSO Work Programme

National workstreams

- **Quality and Safety**
- **Ensure more than 70% of scientific & diagnostic services are part of accreditation programmes and have robust quality assurance measures**
- Radiation safety and new EU regulations – with experts embedded in every trust
- **Increase % of CCGs with confirmed access to scientific and diagnostic commissioning information to 75%**
- Working with Area Team and CCG's in Birmingham, Black Country and Solihull Area Team on advice, toolkits, resources for diagnostic commissioning and a plan for roll out across England

HCS Driving Innovation

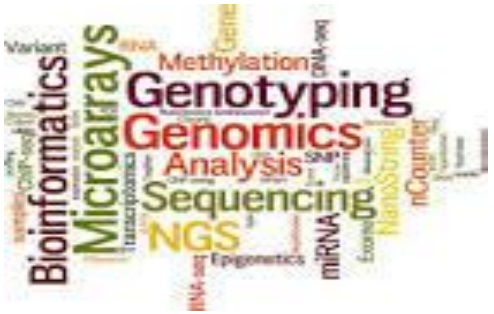


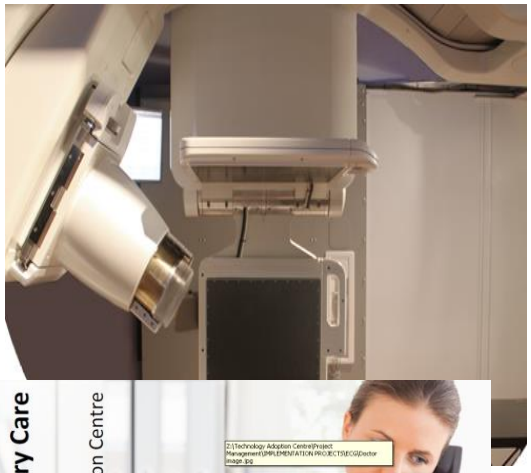
Presentation Outline

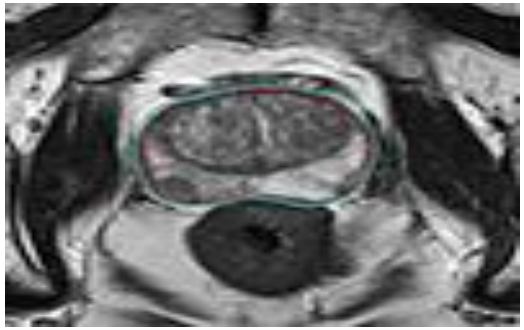
- HCS –who we are and where we fit into the system
- Current seven day HCS scientific diagnostic services provision
- Challenges for HCS diagnostics
- Opportunities for HCS diagnostics
- Innovative diagnostic solutions
- Delivery locations as potential solutions
- Intelligent commissioning of HCS diagnostic services
- Workforce requirement for 7 day service delivery
- Next steps

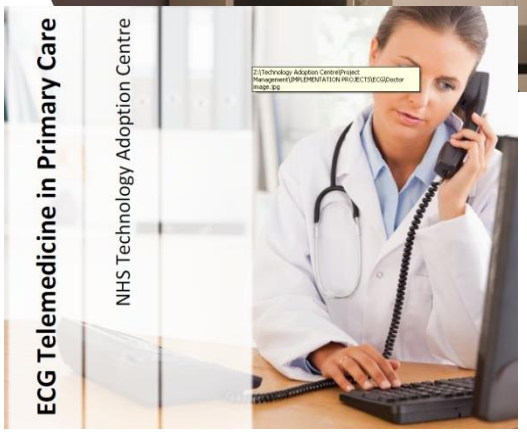
Science will be crucial to meet the challenges

- Genetic profiling
- Genomics
- Personalised medicine
- Enhanced Point of Care Testing
- Portable and home monitoring
- Smart homes
- Bioinformatics
- Virtual physiological human









Transforming care through molecular and genetic approaches

NHS England

Traditional route

Test Results & Treatment
Up to 10 days

5. Follow-up appointment

4. Contact positive patients & arrange follow-up

3. Sample sent to lab for analysis

2. Sample collected

1. Initial appointment with clinician

Using rapid molecular testing for infectious diseases

3. Sample processed at POC

Test Results & Treatment
<1 hour

Sample collected

1. Single appointment with clinician

HearCheck Screener: Primary Care triage

Professor Adrian Davis,
Director of the NHS Newborn Screening Programme, developed a simple hand-held hearing screening device for adults. It is highly sensitive and specific and makes screening and case finding for those who would benefit from amplification easy and very affordable.

Siemens now sell the device worldwide and it is used by primary care in many settings in the UK and worldwide.

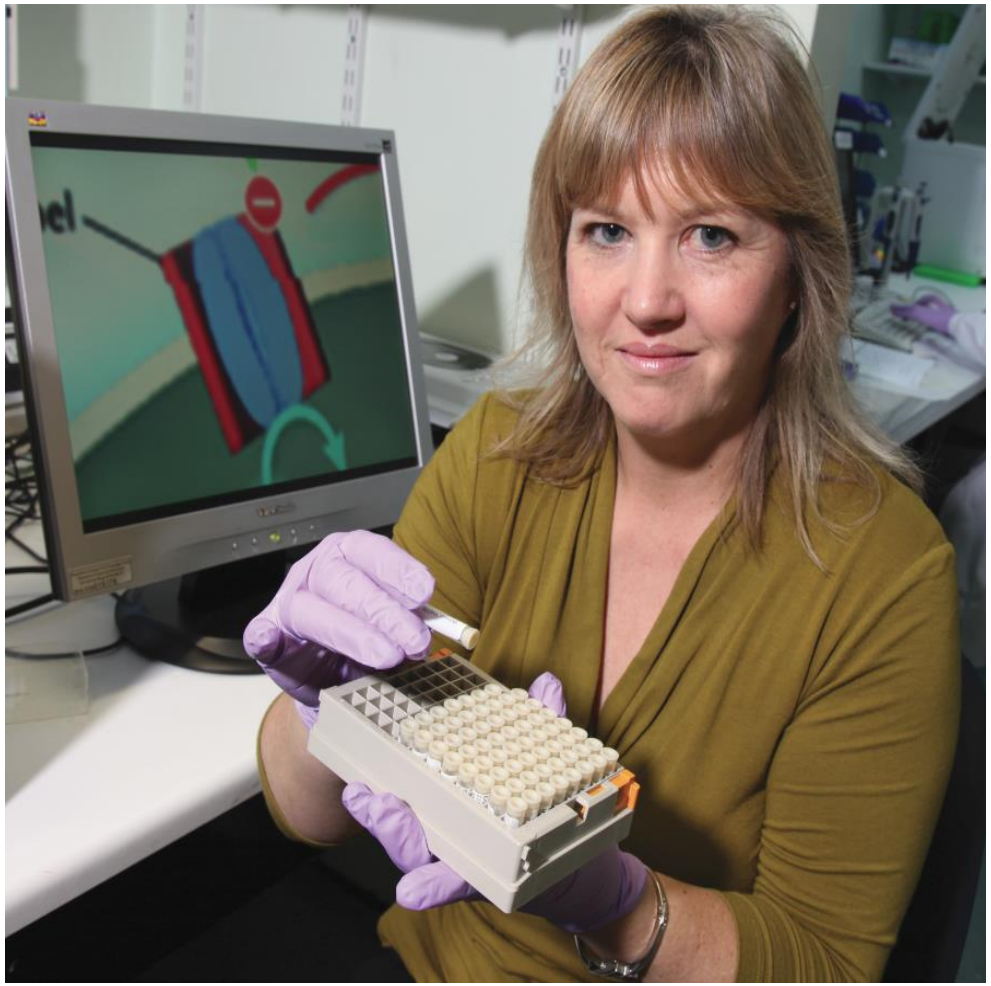
Creating wealth : The Microsoft Partnership

Prof Malcolm Sperrin and his team at the Royal Berkshire Hospital have worked with staff from the nearby Microsoft UK headquarters to use off-the-shelf consumer electronics for health benefits

They have tailored use of the X-Box 360 Kinetic console and basic games for neuro-rehabilitation, particularly in stroke patients

The RBH and Microsoft teams are continuing to work together to broaden the market for Microsoft products while providing lower cost equipment alternatives for the NHS

More effective treatment of diabetes



Professor Sian Ellard – working at Royal Devon & Exeter Hospital developed interest in MODY (a young person's diabetes)

Working with academic colleagues, discovered that a significant number of MODY patients have an underlying genetic cause – and need drug treatment, not insulin injections

Her MODY testing has rolled out to a UK-wide NHS test, transforming thousands of lives, and shows the benefits of the academic healthcare science partnership

More effective cancer treatments

Prof Nick Stone – is one of the country's leading biophotonic scientists working in Exeter

He works on the unique optical fingerprint of cancer cells, developing diagnostic devices for hard-to treat cancers, so ensuring that harmful cells are identified and removed during treatment.

His work straddles academia and service, with roles at both Exeter University and the Royal Devon and Exeter hospital.

Less invasive diagnostics

Becky Clarkson – specialises in physiological measurement in urology at Southmead Hospital.

Accurate diagnosis of urinary problems, such as around enlarged prostate, has traditionally required uncomfortable invasive techniques.

Becky has been carrying out development work on a patentable device for the non-invasive measurement of continuous bladder pressure, balancing computer-based anaylsis with close patient connections to take this work forward.

Commissioning Opportunities

- Innovation will lead to opportunities for providers and commissioners
- Funding and tariff
- National Diagnostics commissioning collaboration project with WM - models
- Commissioners- ensure access to appropriate information for effective commissioning
- De commissioning of services as replacement services are commissioned

Implications for the workforce

Opportunities for the workforce

- New ways of working
- Flexible working practices
- Multi-disciplinary, multi-skilled staff
- Collaborative working
- Innovation
- Robust workforce plans
- Mentoring/ teaching the new generation and colleagues in other professions
- Commissioning education for staff


You don't have
to see the
whole Staircase,
just take the
FIRST STEP

Next steps- priorities
Changes with the biggest impact

- Small steps –identify diagnostics with the greatest impact to be commissioned over 7 days
- Gap analysis of diagnostics provision over 7 days -post SAQ results
- Challenge the system
- Improving adoption of new technology & service redesign
- For patients: ensuring a fresh focus on the identification of undiagnosed, and untreated conditions and the prevention of disease progression
- Liaise with Trust/organisational lead HCS and organisational seven day service leads

Regional networks of HCS ready to support transformation

NHS England

Contact us:

Prof Sue Hill OBE, Chief Scientific Officer for England
sue.l.hill@nhs.net

Jane Blower Deputy Chief Scientific Officer for England (Acting)
jane.blower1@nhs.net

Scientific networks – through the Office of the CSO
england.cso@nhs.net