NHS
National Institute for Health Research

NIHR Collaborations for Leadership in Applied Health Research and Care for Birmingham and Black Country (CLAHRC-BBC)

The CLAHRC Legacy

Showcasing the achievements of CLAHRC for Birmingham and Black Country

This report presents independent research funded by the National Institute for Health Research (NIHR) through the Collaborations for Leadership in Applied Health Research and Care for Birmingham and Black Country (CLAHRC-BBC) programme. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

A Message from the Director

I have been privileged to lead the NIHR Collaborations for Leadership in Applied Health Research and Care (CLAHRC) for Birmingham and Black Country, a five year programme which commenced in October 2008 and will complete on 31st December 2013.

CLAHRC for Birmingham and Black County (CLAHRC-BBC) is a collaborative partnership between the University of Birmingham, over eleven service organisations in our area and patients and the public. We are funded by the National Institute for Health Research to carry out the following three functions:

- **Conduct high quality applied health research**
- **Implement the findings from our research into clinical practice**
- **Increase the capacity of NHS organisations and public, private and third sector partners to engage with and apply research.**

Our research has delivered tangible outputs and impacts and we felt it was important to share our achievements over the last five years to highlight the importance and value our CLAHRC has had locally, nationally and internationally. I am delighted that the following pages in this legacy document will report our achievements showcasing how we have:

- **improved services to benefit patients**
- **built capacity within the NHS and public sector to embed an evidence-based culture**
- **responded to the knowledge needs of the service.**

As well as making improvements to health services, we have generated a robust publication record, brought in over £26million of external funding grants and doubled our original matched funding target of £10million (see pages 4-5).

As a closing remark, I would like to publicly thank everybody involved in our CLAHRC for their commitment and hard work in creating service change and showing that it really has improved patient care.

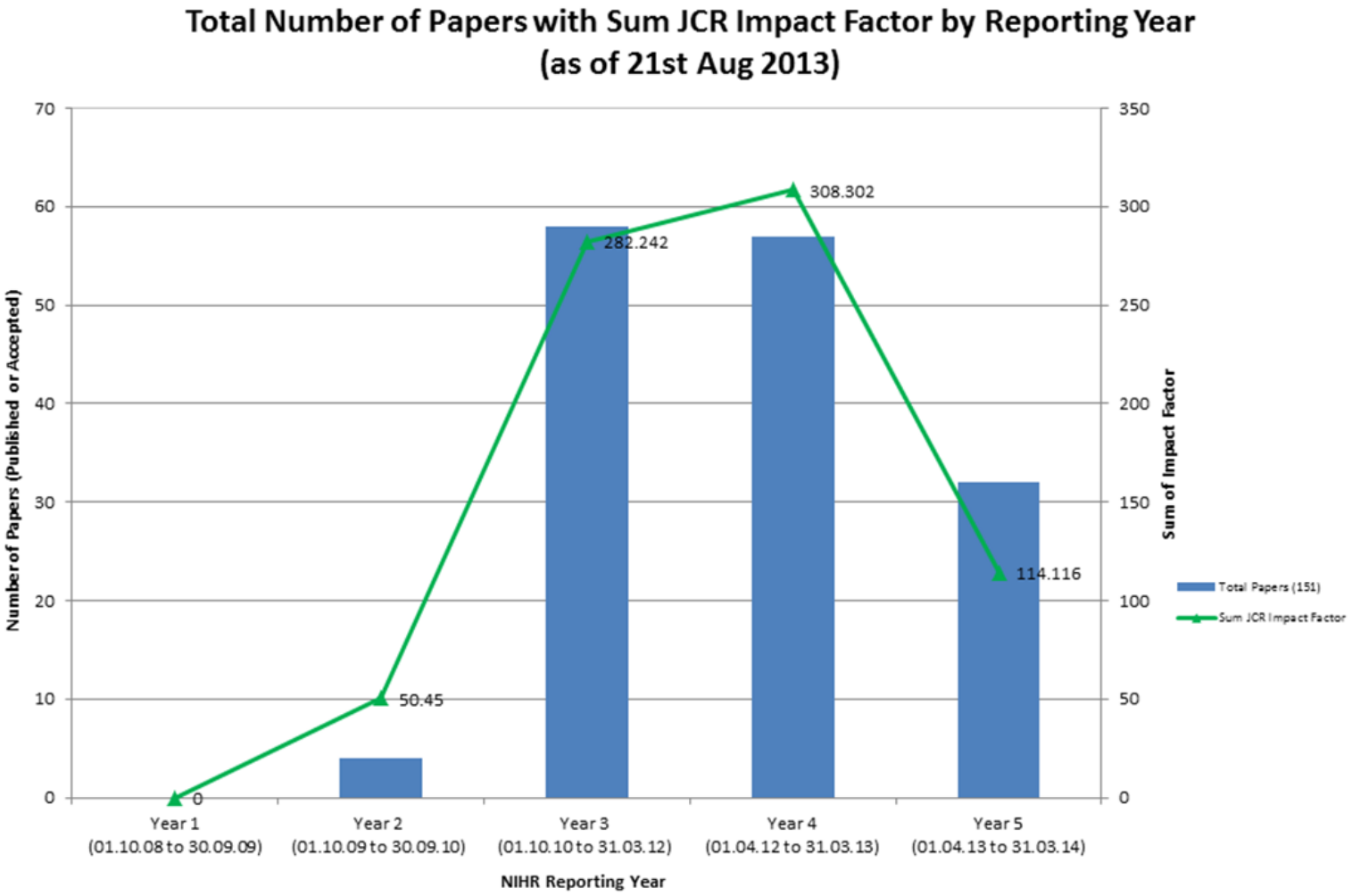
Richard Lilford PhD FRCOG FRCP FFPH
Professor of Clinical Epidemiology
Director of CLAHRC for Birmingham & Black Country

Key facts and figures

CLAHRCs focus on the 'second gap in translation' identified by Sir David Cooksey's Review of UK Health Research. The aim is to embed high quality applied health research within NHS organisations to facilitate evaluation and adoption of evidence into day-to-day practice.

CLAHRC-BBC consists of nine research themes which have been evaluating service interventions in areas such as paediatrics, stroke, maternity care, youth mental health, cardiovascular disease, diabetes and patient safety. Some of the information generated from our service evaluations has been fed back to service managers in order to develop and shape new services and other evaluations have taken place over a longer period of time and influenced service developments downstream.

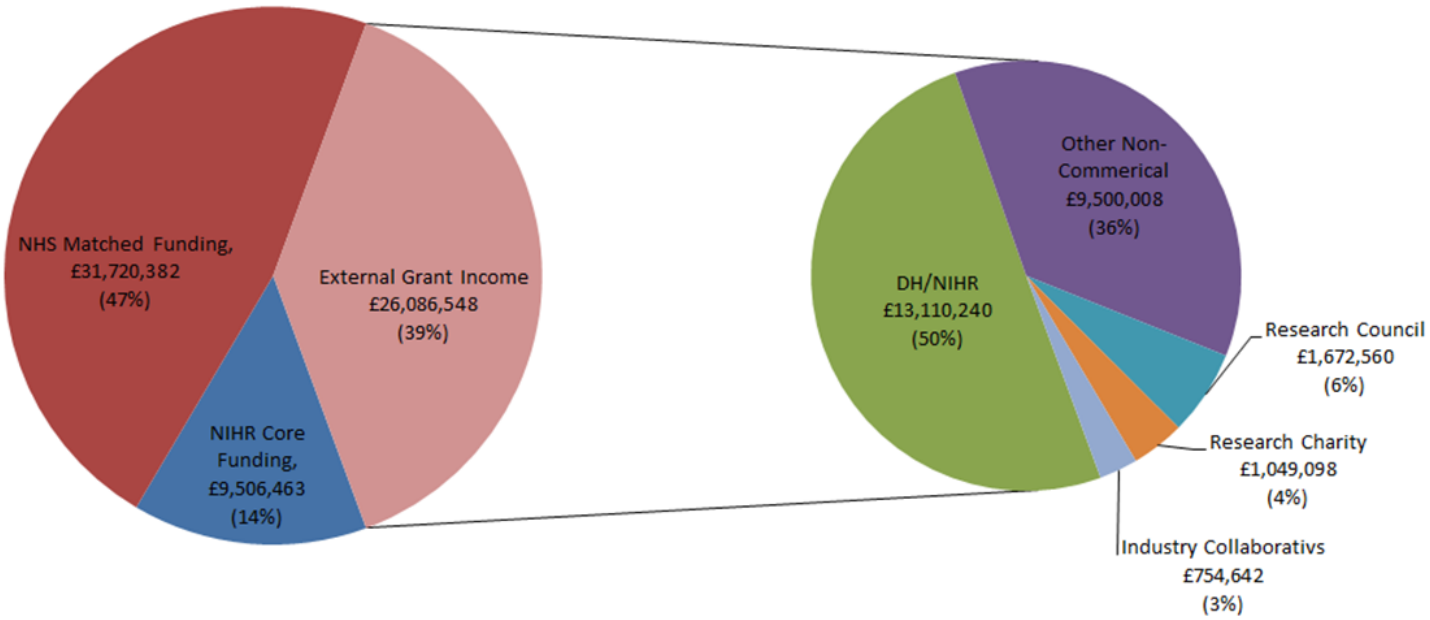
As well as making improvements to health services we have also published our research in high impact medical journals. We have 151 articles published or accepted for publication at the time this report was printed including 4 articles in the Lancet, 14 in the British Medical Journal and 3 in Annals of Internal Medicine. And the best is yet to be!



CLAHRC-BBC is funded by the NIHR and also through matched funding from service organisations. The NIHR income has supported the research and most of the matched funding has supported the actual service development or intervention. We have secured £31,720,382 of matched funding across our programme, thereby exceeding the original requirement of £10million.

We have also been successful in applying for external competitive grant funding to carry out further research and service evaluations and secured £26,086,548 across the programme to date.

CLAHRC-BBC Funding Profile (as of 21st August 2013)*



*
NHS Matched Funding - obtained by end of FY 2012/13
NIHR Core Funding - expenditure to end of FY 2012/13
External Grant Income - obtained as of 21st August 2013

As well as publishing papers and gaining competitive external funding, the evidence we have generated through evaluating services is being used to inform future service design. In the following pages we highlight our impacts and success over the last five years in improving services to benefit patient care through showcasing specific case studies from our research. Also look out for our News In Brief items which give snapshots of some of our findings.

Brokering Innovation through Evidence

Through our research we have been generating evidence which has made an impact on how health services are delivered. In the case studies showcased below, we demonstrate how we have contributed to NICE guidance and other health policies and we highlight evidence based changes in practice and service delivery.

In order to communicate our findings we produce CLAHRC BITEs (Brokering Innovation Through Evidence) to disseminate findings and give recommendations for practice. Each BITE is based on published work and aims to summarise findings in an easily digestible format for health practitioners, patients and the public. The BITEs contribute to a national library across all CLAHRCs and are disseminated locally through NHS partners and at national conferences.

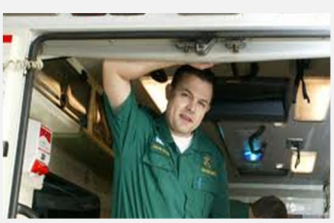
Optimising care for stroke patients

Researchers in our stroke theme have demonstrated that significant in-hospital delays occur for patients that might be suitable for clot busting drugs because paramedics do not always record onset time. Onset time is critical for the effective management of suspected stroke patients as thrombolytic or clot busting drugs must be administered within a 4.5 hours treatment window, following a full diagnosis from brain imaging tests (CT scans).

A number of changes have been implemented to improve services for stroke patients:

- An enhanced electronic proforma has been developed for use by all paramedics in the West Midlands Ambulance Service. The proforma includes 'Time of Onset' in the Face Arm Speech Test (FAST) assessment to improve reporting rates and facilitate more efficient in-hospital care.

- A 'Paramedic Liaison Officer' has been employed to act as a knowledge-broker between the West Midlands Ambulance Service, hospital A&E departments and University of Birmingham. The Officer possesses detailed knowledge about the different care pathways operating at several hospitals and is familiar with the variation in practice for the administration of clot busting drugs. He has been working with the organisations to improve data recording and handover times from ambulance to A&E.



What is FAST? Face Arm Speech Test (FAST) test aims to improve paramedic recognition of stroke to facilitate faster treatment in-hospital treatment.

Increasing the number of women being offered and accepting membrane sweeping to reduce the induction of labour.

An educational intervention to increase membrane sweeping to reduce the need for formal induction of labour has been developed, and evaluated through cluster-RCT, by our maternity theme. An audit at the Birmingham Women's Hospital (BWH) showed that offering membrane sweeping to reduce induction of labour was not being carried out routinely in clinical practice even though there is evidence and NICE guidance to support this procedure.

Training of the ten midwifery community teams took place between May and early September 2012 by the practice development midwives and researchers are using a step-wedge trial design to evaluate the impact on membrane sweeping.

This theme has established strong working relationships with local Maternity Trusts, which has led to additional collaborations between researchers on this theme and NHS staff. Increasing the number of women being offered and accepting membrane sweeping to reduce induction of labour is just one example of additional collaborative projects created through these interactions. Senior Researcher, Dr Sara Kenyon, meets regularly with clinicians and NHS managers and was recently asked to attend a meeting with BWH Chief Executive who had heard about the work of the CLAHRC maternity theme.

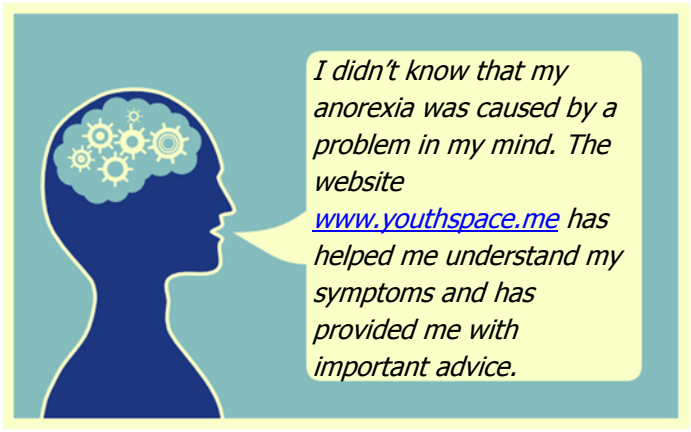
Dr Sara Kenyon comments on her CLAHRC role below:

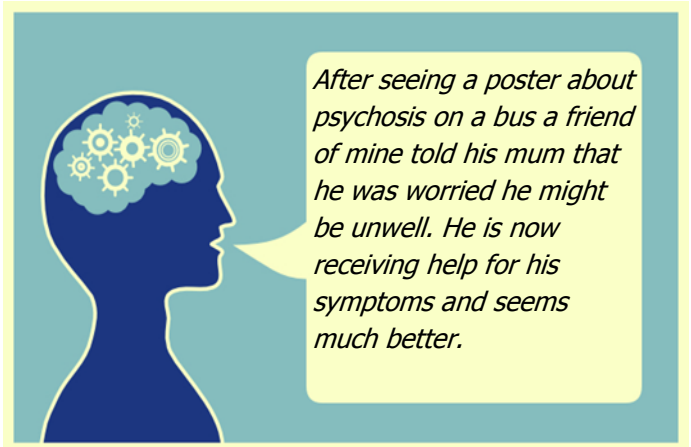
"I am using my skills as an academic researcher to work alongside the clinical area. […] My role more broadly is to work with the clinicians with whatever they bring us and to use the skills that I have to improve care for mothers and babies. […] Practice does not change as a result of guidelines sitting on a shelf. […] You need the guidance to outline the change in practice and then you need people to go and tell the staff the evidence behind the change in practice and why it is necessary. […] For example, with the membrane sweeping training, we held a discussion group with a member from each of the teams to find out what they think the barriers are to why this is not in practice. After the training package is developed, we will then meet with a couple of midwives within the teams to see how the training has gone down and if the barriers have been addressed and if people are starting to do more sweeps."

Evaluation of radical redesign of mental health services for young people

Our mental health theme has generated important knowledge to understand where and why young people in Birmingham with psychosis experience delays in receiving treatment. This learning and knowledge has been transferred directly to the redesign and reorganisation of services locally.

Our research has demonstrated that the transition between child/adolescent services and adult services at 16-18 years is a major weakness in service provision: many get 'lost in transition' at the very point where the age incidence of mental health problems increases and many young people up to 25 do not engage in 'adult' services. Based on our evidence, entirely new sets of clinical, policy and commissioning guidelines have been developed by the Joint Commissioning Panel for Mental Health. Internationally, transitional care and youth mental health have become important clinical, service development and policy priorities in EU, Australia, USA and Canada. Additionally, a new integrated care pathway for young people in Birmingham ('Youthspace') has been implemented, bringing together child/adolescent services, adult and third sector partners.



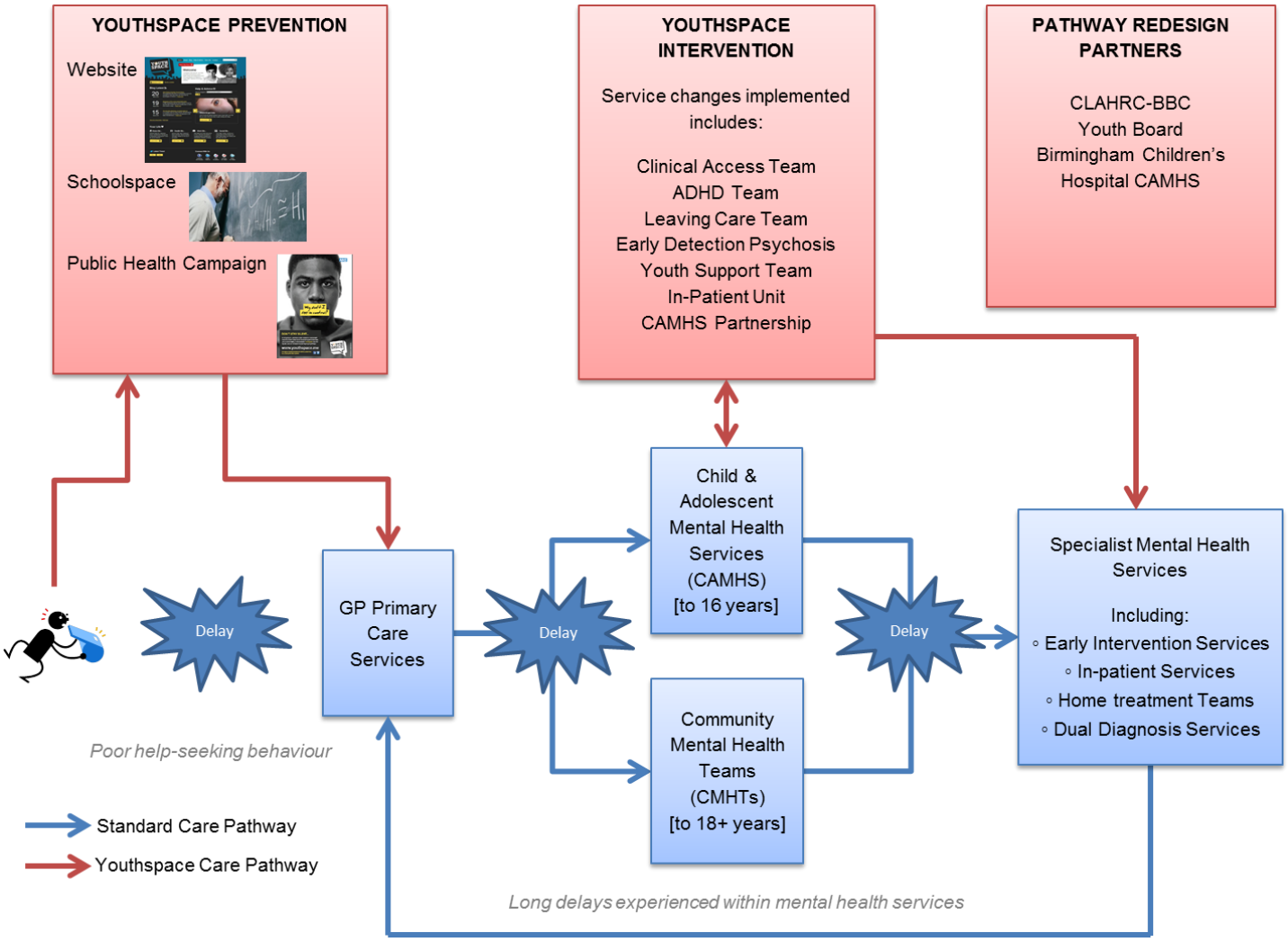


The thoughts above represent a number of initiatives developed and implemented by our mental health theme

Changes to the youth mental health care pathway

The figure below shows the new Youthspace integrated care pathway for young people with mental health illness. The new pathway includes ***preventative measures*** aimed at raising awareness and encouraging young people to seek help more quickly and, evidence-based ***service interventions*** to remove some of the blockages within mental health services, including:

- Clinical Access Teams to improve triage systems to reduce delay from primary care services
- ADHD Team to ensure more effective triage and improve transition from child to adult services
- Leaving Care Team to support children who are looked after by social care services
- Early Detection Psychosis to improve early intervention services for young people with psychosis
- Youth Support Team to help young people with mental illness between ages 16-18
- A new In-patient Unit to support young people with eating disorders
- CAMHS partnership creating stronger service links to improve the transition from children to adult mental health services.



Commissioners to benefit from paediatrics advice and guidance service model

Evidence from our paediatric theme has influenced service change and helped facilitate cost savings at Birmingham Children's Hospital NHS Foundation Trust.

Researchers have been evaluating the Birmingham Children's Hospital Paediatric Outpatient Referral, Triage and Liaison pilot service (PORTAL), an advice and guidance service in general paediatrics. They found that the pilot was effective in reducing outpatient attendance, it was cost effective, and facilitated the transfer of knowledge between primary and secondary care.

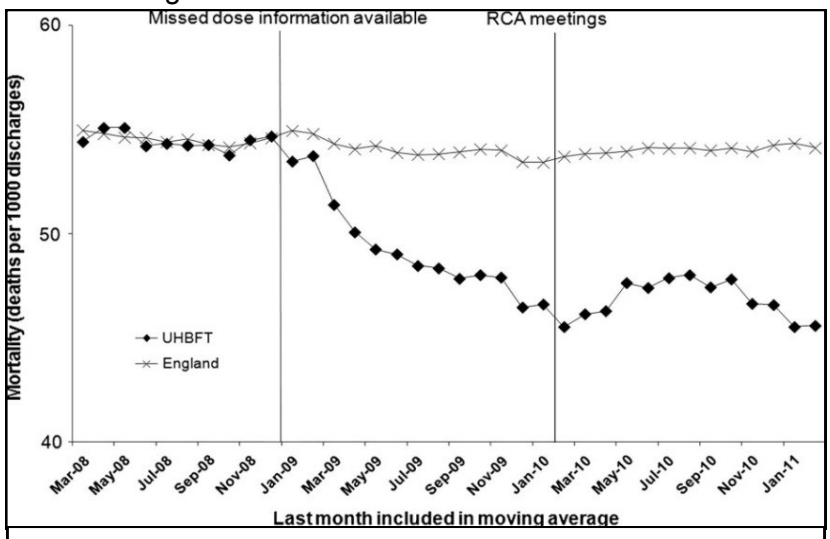
This evaluation has led to an extension of the service and Birmingham Children's Hospital is now in discussion with the local clinical commissioning group about extending this model beyond the trust.

Improving the quality and safety of services using Information Technology

A quality improvement programme aimed at reducing errors in prescriptions of medications in hospitals has been examined by CLAHRC-BBC researchers.

Patients do not always get the medications they have been prescribed, which can have adverse consequences, for example, it is vital that frail patients maintain antibiotic concentrations to overcome severe infections. Using data collected by a prescribing information and communication system, an audit of missed medication doses at University Hospitals Birmingham NHS Foundation Trust showed that 15 per cent of doses were omitted.

In response to this, a system of active feedback was implemented in which senior managers met with nursing staff on the ward and the reasons for failure to administer medication were explored. Staff were asked to propose solutions to the problems and, by establishing 'root cause analysis' meetings, they were challenged to reduce the incidence of missed doses.



Time series plot of 12-month moving average mortality rates for England (crosses) and University Hospitals Birmingham NHS Foundation Trust (diamonds).

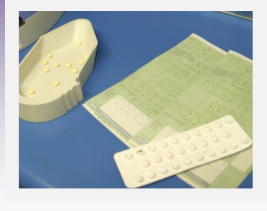
Trust intervention points labelled.

The graph shows there was a step change in the proportion of missed doses and mortality rates in the hospital fell at the same time, with a 16.2 per cent reduction demonstrated compared to static mortality rates throughout England. There is strong evidence that the timely administration of antibiotics is associated with reduced mortality, and it is therefore plausible that the reported improvements in antibiotic administration rates have had an impact.

Although researchers cannot be sure this was cause and effect, they plan further controlled studies in other hospitals to improve on practice further and to see whether the effects on mortality can be replicated.

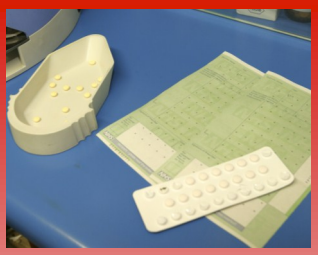
News in Brief

Researchers in our diabetes theme have shown that there is an association between lack of sleep, use of multi-media and BMI. Mobile phones were shown to have the highest negative impact on sleep while watching TV and playing video games had the greatest link with high BMI.



Our cardiovascular disease (CVD) prevention theme has shown that many patients and GPs have significant concerns about taking preventative medication for CVD - preferring to make lifestyle changes to reduce their risk.

Most statins prescribed to the wrong patients



Researchers in our cardiovascular prevention theme have shown that most patients prescribed statins are actually ***not*** at high risk of heart disease. Analysis of 365,718 patient records from 421 general practices in Birmingham showed that 58% of patients, with no previous clinical evidence of cardiovascular disease and who were prescribed lipid lowering drugs by end of two year follow-up, were actually not eligible for the treatment.

All patients with heart disease are recommended statins but among patients who do not have heart disease, statins are only recommended to those classified as “high risk”. Patients at high risk include people who smoke, have diabetes, have higher blood pressure, and have higher cholesterol levels and/or older people.

Statins are not recommended for those at low risk: generally younger people who are in good health. The records showed that over the two year study period only three in ten high risk patients were started on statins, meaning that most high risk patients missed out on treatment – even though they consulted their GP an average of eleven times.

In addition, one in ten low risk patients were started on treatment, meaning that many were over-treated. In total during this period over 50,000 patients were started on statins but only 21,000 (42%) were thought of as high risk. Patients aged over 65 years, with diabetes and those who consulted more frequently were more likely to be started on statins.

Commercial slimming clubs trump local primary care led weight management programmes on effectiveness and cost

Findings from the Lighten Up trial, supported by researchers working on our cardiovascular prevention theme, have been included as a case study in the Department of Health report: *Healthy Lives, Healthy People: A call to action on obesity in England* (DH, 2011) and recommend that GPs should refer patients to commercial programmes instead of investing in their own local service interventions.

The Lighten Up trial compared the effectiveness of the UK’s biggest commercial slimming clubs with that of primary care led weight loss programmes provided by South Birmingham PCT. Findings showed that commercial programmes were most effective and less costly when compared to ‘own-grown’ weight management programmes.

740 men and women with obesity or who are overweight with a co-morbid disorder identified from general practice records participated in the trial under six different services. It was found that all programmes achieved significant weight loss from the start until the programme end, and all except general practice and pharmacy provision resulted in significant weight loss at 1 year. After three months participants using GP support lost an average of 3lbs, while Weight Watchers participants shed more than 9.5lbs. After 1 year, dieters using Weight Watchers were also most successful at keeping off the weight compared to those in the primary care programmes.

The primary care interventions were the most expensive to provide costing £112 per participant compared to £76 per participant to attend commercial slimming clubs such as Weight Watchers.

Prior to this study we already knew that some commercial and primary care based weight management programmes have been shown to produce significantly greater weight loss than in a control group after one year. This study adds that in a primary care population, group based programmes produced significant weight loss at one year after a 12 week programme. One-to-one primary care based programmes were ineffective and most costly to provide. Short commercial and NHS group based programmes have the potential to produce clinically useful weight loss at one year follow-up. This evidence has allowed commissioners to enhance the service by ensuring that the treatments offered are clinically effective.

Developing Research Capacity

One of the aims of CLAHRCs is to build research capacity of NHS organisations and public, private and third sector partners to engage with and apply research and embed an evidence-based culture. We have done this through a variety of methods such as:

- PhD studentships
- Research funding opportunities for health practitioners
- Worked with health services to gain external funding to carry out collaborative research projects
- Further expanded our geographical spread in our region to promote a culture of collaborative applied health research
- Developed international collaborations to spread the impact of our evidence further afield.

A day in the life of a CLAHRC PhD student

Establishing a successful postgraduate training programme

Throughout the life of the programme we have offered 22 PhD students placements, attracting high calibre students via a rigorous selection process and by offering a generous stipend in line with the Wellcome Trust funding scheme. During their time with CLAHRC-BBC our students have received a bespoke training and support package established by our supervisors and researchers. There has been a clear focus on methodology, academic writing, career progression and students have been privileged to work in 'real world' scenarios with partner NHS organisations.

One of the most beneficial things about being a CLAHRC PhD student has been the opportunity to develop closely alongside peers from other themes, using our experiences from different disciplines, research methods and areas of interest to learn together about research planning, delivery and communication, and to provide mutual support. Also, attending monthly tutorials with experienced sociologists, who push the boundaries of our knowledge and abilities through presentations, peer questioning, and intensive discussion. Finally, being part of CLAHRC has ensured awareness and access to NIHR and other health service events and training that have been highly instructive, and may otherwise have been missed." [CLAHRC PhD Student 3]

"For me, there are two key aspects that make completing my PhD within the CLAHRC programme an empowering and motivating experience. Firstly, that I am able to complete applied research that can make a difference to how our local NHS organisations operate. Working alongside health care professionals to develop my research has given me a fantastic insight into the workings of the NHS as well as strengthened the applicability of my work. Secondly, it has enabled me to join a community of researchers who although working on a variety of different projects all have the same aim, to collaborate with our NHS partners to deliver high quality health research. This makes the team truly inspiring to work within." [CLAHRC PhD Student 2]

"I've found the PhD qualitative research training to be absolutely invaluable, both for the development of my thesis, but also in terms of my confidence in myself as a researcher." [CLAHRC PhD Student 1]

Home birth…informing without coercing

Our maternity theme has been working closely with local maternity Trusts and units to improve awareness of important new evidence on the safety of place of birth. Evidence generated from the national Birthplace study has enormous potential to influence service provision and could be used to help women make an informed choice of birth setting.

The Birthplace study compared the safety of birth in four settings: home; freestanding midwifery units (FMUs), alongside midwifery units (AMUs) and obstetric units (OUs). The main findings relate to healthy women with straightforward pregnancies who are considered 'low risk'.

Key findings

- Giving birth is generally very safe
- For all 'low risk' women the risk of experiencing adverse perinatal outcomes is small
- Midwifery units appear to be safe for the baby and offer benefits for the mother
- For women having a first baby a planned home birth increases the risk for the baby
- For women having a first baby there is greater chance of being transferred to an obstetric unit during labour or after the birth
- For women having a second or subsequent baby, home births and midwifery unit births appear to be safe for the baby and offer benefits for the mother.

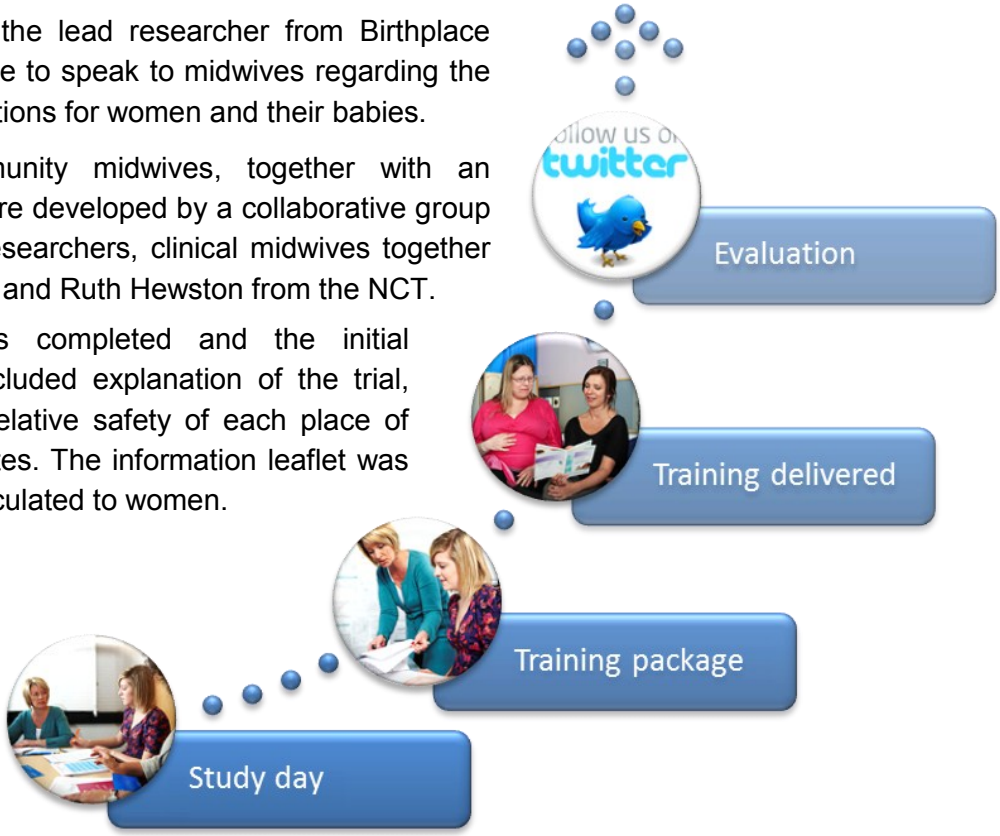
After close interaction with maternity services, it became clear that the study was not widely known about or clearly understood. In light of this, our maternity theme responded in several ways:

A study day took place where the lead researcher from Birthplace study, Dr Jennifer Hollowell, came to speak to midwives regarding the study, its findings and the implications for women and their babies.

A training package for community midwives, together with an information leaflet for women, were developed by a collaborative group which included CLAHRC-BBC researchers, clinical midwives together with Dr Hollowell from Birthplace and Ruth Hewston from the NCT.

Training of the midwives was completed and the initial evaluations collated. Training included explanation of the trial, methods and results regarding relative safety of each place of birth, intervention and transfer rates. The information leaflet was printed by the local Trusts and circulated to women.

An evaluation of training by midwives was carried out immediately and 3 months after the introduction of the leaflet for women. Women were asked to complete a postcard distributed with the leaflet or to Tweet or email comments. This evaluation will be completed in the early summer and represents an initiative to facilitate choice for women.



Other Maternity Trusts may wish to use this training session for midwives and the information leaflet for women to facilitate informed choice and plans are in place to have the training package and leaflet endorsed by the Royal College of Midwives.

Building research capacity across organisations

We have supported a number of MD placements funded by NHS partner organisations or through industry collaboratives. The model represents a win-win as organisations gain the supervision and expertise of high-level academics and the CLAHRC programme gains additional research projects and outputs.

The first MD student, Sabina Rashid, was recruited to our health service redesign theme through Sandwell and West Birmingham Hospitals NHS Trust. The theme's surgical MD scheme provides direct clinical input into research and raises the profile of the study within Trusts. Sabina's work showed that the organisation of acute and day case laparoscopic cholecystectomy services could be improved by adjusting theatre sessions and anaesthetic cover. Subsequently two other MD students have worked with the theme to examine operating theatre use and care pathways.

Our diabetes theme is supporting two MD placements, Wen Bun Leong and Ananth Nayak. Wen's MD placement is funded through an industry collaborative and her review of the current evidence base on the role of bariatric surgery in the treatment of type 2 diabetes has been published in the Journal of the Royal College of Physicians, Edinburgh. Wen has also led the section on multidisciplinary care for the RCP report "Action on obesity: comprehensive care for all" published in January 2013 (see http://www.rcplondon.ac.uk/sites/default/files/action-on-obesity.pdf).

We have embedded a number of shared posts within health services and Local Authorities to act as knowledge-brokers. These people act as CLAHRC associates, bringing together inherent service knowledge and science to facilitate service improvement. We have a number of shared posts with Worcestershire County Council, who have recently supported the public health department with their Joint Strategic Needs Assessment (JSNA).

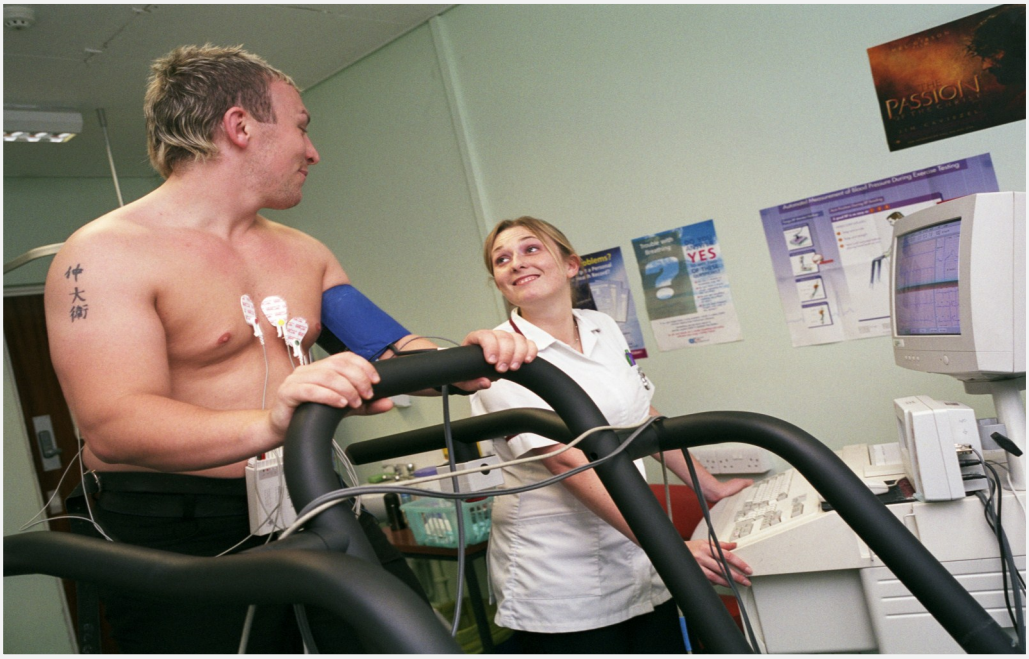
Spreading our research around the world

Our researchers have been building international links to help spread our research knowledge across other countries and to generate sustainable capacity. Some specific activities are described below:

Our CLAHRC is regularly consulted by international organisations in the area of health economic assessment of service delivery interventions to improve quality and safety. Professor Richard Lilford has been invited to present his work in this area at the University of Hong Kong, the IQ Scientific Institute for Quality of Healthcare at the Nijmegen Medical Centre, Radbound University, The Netherlands and the African eHealth Economics Forum in Nairobi. Furthermore, Professor Lilford provides methodological expertise to the Agency for Health Research and Quality (AHRQ) in USA, Research and Development (RAND) and the World Health Organisation amongst others.

Our patient safety and IT theme collaborates with European partners through resources obtained from an additional European Regional Development Fund grant and is developing research in electronic prescribing and safety with the Clinical Pharmacology group at the University of Heidelberg in Germany. Furthermore, they are collaborating with researchers from the world-leading Brigham and Women's Hospital in Boston in an international study to compare different clinical decision support systems and their alerts.

Professor Max Birchwood from our mental health theme is co-convenor of the 2nd International Conference on Youth Mental Health, taking place in Brighton in October 2013 which has involved collaboration with youth mental health experts from Australia, Canada, Ireland, The Netherlands and USA.



Working with GPs to evaluate the implementation of a cardiovascular prevention programme

We know that drugs to reduce blood pressure and lower cholesterol can lower the incidence of cardiovascular disease (CVD). Currently, high risk patients who can benefit from treatment to prevent CVD are identified opportunistically in primary care, but patients consulting for other reasons do not always have their risk factors assessed. Therefore, many of those at high risk are not identified or they do not always have drugs prescribed if they are identified.

One solution is to implement targeted case finding which means automatically searching electronic patient records using existing data to identify patients most likely to be at high risk of CVD. They can then be invited for assessment and treatment.

We are using a step-wedge trial – a 'naturalistic' but rigid design – to quantify the benefits of such a targeted case finding programme compared to opportunistic assessment.

A pilot was undertaken in six Sandwell general practices. Electronic patient records were searched to identify untreated patients aged 35-74 whose 10 year risk of CVD was 20% or higher. They were then invited to their GP for assessment by a project nurse and offered treatment if appropriate. Three times more high-risk patients were started on treatment in intervention practices than in control practices.

Following the pilot, the project was rolled out across Sandwell general practices which are made up of clusters of patients, making it a cluster study. The order in which practices receive the targeted case finding intervention is randomised.

Our researchers are now working with GP practices to compare the rate at which patients started treatment during the period of opportunistic assessment with the rate at which they start treatment during the period of targeted case finding.

We hope to be able to determine if case finding is more effective and cost effective in achieving higher rates of uptake of preventative advice and treatment, if it results in fewer outpatient referrals with admissions to hospital for CVD-related events, and if it is acceptable to clinicians and patients.

It is possible to design a stepped wedge randomised controlled trial using prescription data from electronic patients records to determine the effectiveness of a cardiovascular prevention programme

Transferring our knowledge and knowledge management

In order to implement the findings from our research into clinical practice we have developed an integrated knowledge management process. We have been working with our service partners and patients and the public, not only to evaluate new service developments, but to determine what those developments should be.

The case studies in the following pages will showcase how we have been responding to the knowledge needs of the service, transferring our knowledge to make service improvements and changing the mind-set of national leaders.

Using knowledge exchange to identify and address local healthcare priorities

We have established dedicated forums to share knowledge and increase the bonds between academia and health services. Knowledge exchange forums are usually held at the request of an NHS organisation, which hosts the event and sets the agenda. CLAHRC-BBC will work with them to help fulfil their needs, which often includes carrying out rapid evidence reviews and inviting experts to present the 'world's knowledge' on a topic during the forum.

The forums are a two-way conversation offering a valuable opportunity to share information and identify and address local priorities by getting academic research into practice. They also enable academia and services to collaborate on funding applications and service evaluations. The example below highlights how CLAHRC-BBC has brought health practitioners together and is supporting them in improving the way services are delivered.

Stakeholders from Birmingham & Solihull Mental Health Foundation Trust and Birmingham Children's Hospital are working together to improve the transitional pathway for patients with ADHD from child to adult services in Birmingham. This partnership directly resulted from a knowledge-exchange forum on ADHD facilitated by CLAHRC-BBC at the request of service managers.

Paediatric 'care closer to home': stakeholder views and barriers to implementation

Providing care closer to home by moving health services out of hospitals into community locations has been advocated as a way of improving access to healthcare, increasing patient satisfaction and relieving demand on hospitals. However, there are very few studies around moving paediatric outpatient services into community settings. Researchers in our paediatrics theme evaluated two consultant-led outpatient clinics provided in the community by Birmingham Children's Hospital NHS Foundation Trust. As part of their research, they interviewed a wide range of NHS clinicians and managers from the hospital and community clinics as their views can affect the development and success of new services.

The research showed that while the concept of care closer to home was sound in theory, there were significant financial and practical challenges in practice. At the very least, services must replicate existing hospital outpatient care standards and provide equal access for families. The hospital was thought to deliver the ideal outpatient service model, but reproducing this in the community using a 'drag and drop' approach had few additional benefits. Shifting care into the community was also found to have an impact on the sense of professional identity held by health service providers, as they attached meanings to the place of care.

The researchers concluded that moving consultant-led, paediatric outpatient clinics out of hospitals and into the community not only requires physical relocation; services need to be redesigned as part of the process. Their research also highlighted the importance of considering the views of health service providers and health service users when implementing care closer to home.

A framework for evaluating policy and service interventions

The effect of many cost effective policy and service interventions cannot be detected at the level of the patient. We have designed a new framework which could help improve the design and interpretation of evaluative studies.

Our framework for evaluation of complex interventions draws a crucial distinction between targeted service interventions (with close coupled effects at the patient level) and generic service interventions (that act through mediating variables to yield diffuse effects at the patient level). We hope that our model will be useful for those who navigate the complex intellectual terrain of policy and service evaluation.

Successful engagement with maternity services to improve care for women

Spearheaded by Dr Sara Kenyon, our maternity theme has built solid relationships with Birmingham Women's Hospital, providing them with some additional capacity to support specific projects and respond to their knowledge-requirements. Recently, the theme was asked to assist in the development, implementation and evaluation of a Triage system for pregnant women, to ensure that priority is given according to clinical need.

The development of the four category system for symptom based algorithms for the identification and immediate care of women admitted to Triage has been led by Dr Nina Johns (Delivery Suite lead Obstetrician) together with Dr Sara Kenyon and other CLAHRC researchers. The system was implemented in April 2013 and over 70 midwives have been trained using a package developed by the collaborative group. An evaluation of the system is underway to look at the impact on waiting times, as well as maternal and neonatal outcomes, and to capture the women's views on the service.

A subsequent project is planned to spread the adoption of the Triage system into additional Maternity units to support a definitive evaluation.

News in Brief

Our housing and health theme have shown that telehealth devices for individuals with COPD provided peace of mind, reduced feelings of anxiety, isolation and built confidence in their ability to self-manage the condition.

A pilot study of the relationship between fast food provision and neighbourhood characteristics suggests there is a positive association between neighbourhood deprivation and the density and proximity of fast food outlets in Sandwell and Dudley.

Our health service redesign theme has shown that in the treatment of STEMI (ST wave elevated myocardial infarction) bypassing the A&E department and taking patients directly from the ambulance to the cardiac laboratory reduced delays in treatment. It is essential that the blocked arteries, which cause this type of heart attack, are 're-opened' through the insertion of a catheter. The time this takes is known as the door-to-balloon time. In light of these findings one Acute Trust in Birmingham is reviewing its STEMI pathway with a view to redesigning it.

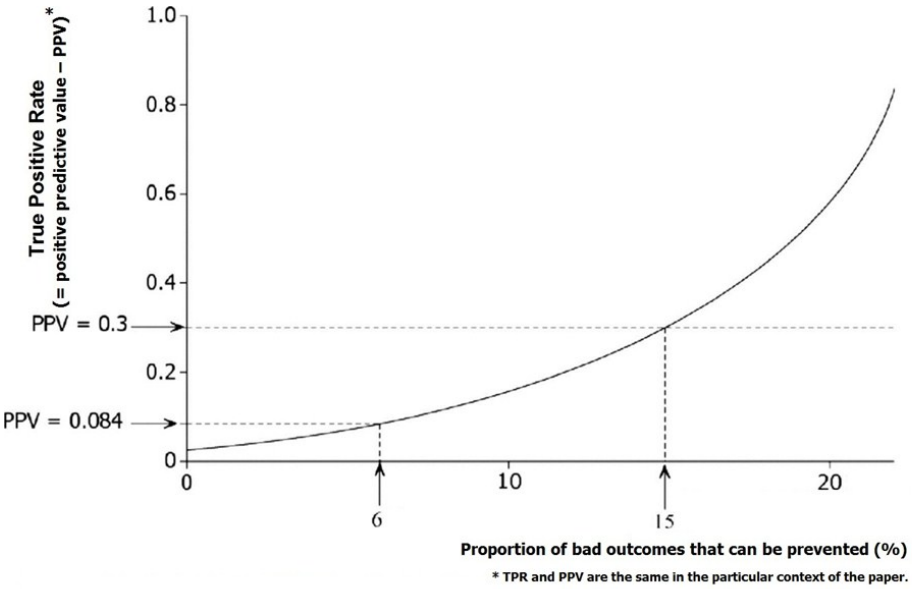
Patients with a STEMI type heart attack experience longer delays in door-to-balloon time if they arrive at hospital 'out-of-hours', compared to in-hours (9am -5pm). Local doctors, commissioners, and the Cardiac Network are discussing models for out-of-hours STEMI services with the researchers, to agree on the most cost-effective Birmingham wide service model capable of delivering the best service for patients with this condition.

Influencing the national mindset

Our work on examining Standardised Mortality Ratios (SMRs) as a diagnostic test for preventable mortality has influenced national thinking to move away from the use of SMRs to judge hospital performance (see below).

When the outcomes of health care are monitored, it's usually the overall outcome that's measured (overall death rates, for example, or blood stream infections). These rates are risk adjusted. However, it is only the preventable component of an overall rate that reflects what we are after – the quality of the service. We have constructed an equation to show how well adjusted overall rates reflect the preventable component. When the preventable component is over 30%, as in bloodstream infections, then the overall rate is a good diagnostic test for the preventable component. However, if less than 20% of outcomes can be prevented by optimal care, as in hospital deaths, then overall rates are a poor guide. No doctor would use them as a test for a disease because both false positive and the false negative rates exceed 70%. There's always a cost to false positives and such a test is likely to do more harm than good even when used as a screening test. The equation shows that the ability of an overall rate to predict the preventable component is also sensitive to how much the preventable rate varies across the system.

Here is a graph from our published work which examines standardised mortality ratios (SMRs) as a diagnostic test for preventable mortality. Even if risk adjustment can explain a massive 80 per cent of the variance between hospitals, you can see that SMRs are a poor screening test; SMRs are neither sensitive nor specific at hospital level because less than 20% of mortality is preventable.



Sir Bruce Keogh, National Medical Director for NHS England stated in his Review on Mortality published in July 2013 that

"However tempting, it is clinically meaningless and academically reckless to use such statistical measures to quantify actual numbers of avoidable deaths."

Furthermore, Professor Richard Lilford appeared on BBC Radio 2 and local BBC news discussing how SMRs should not be used to judge hospital performance.

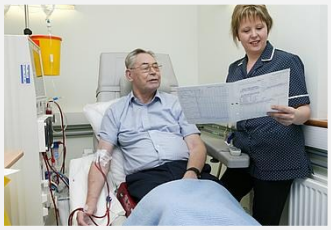
Has the health service improved?

The evaluation of the Health Foundation's Safer Patients Initiative (SPI), taken forward under the CLAHRC-BBC programme, showed that health services had been improving gradually over time (2004-2009) within the 22 English NHS hospitals that participated in the study. We found improvement in the following areas:

1) **Quality of monitoring sick patients on the ward**
2) **Staff perceptions of the organisation climate**
3) **Public satisfaction with some aspects of the service**
4) **The quality of medical histories**
5) **Hygiene and infection rates**
6) **Intra-operative temperature monitoring (improved in both groups but not significantly).**

Many criteria of evidence-based care were so good at the start of the study that there was little headroom for further improvement – even after the introduction of the service improvement toolkit. For example, using the correct medication for respiratory disease and providing the correct prophylaxis before surgery.

The findings from this study imply that many aspects of care are already good or improving across NHS England, suggesting improvements in quality and safety across the board.



Improving the uptake of home therapies by patients with chronic kidney disease

A study previously funded under the West Midlands Central Health Innovation and Education Cluster and now adopted by CLAHRC has evaluated how four hospitals have been working to increase the uptake of home therapies by patients with chronic kidney disease.

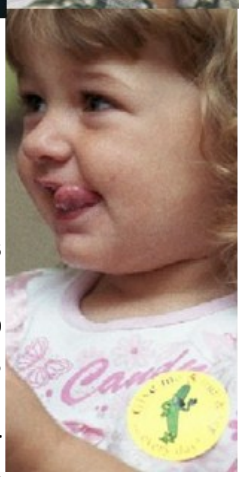
The research found that most patient barriers to home therapies were patient motivation, myths and misunderstanding regarding treatment, difficulty in understanding complex information, decision making and psychological and emotional issues. Staff also needed to increase their knowledge and experience of home therapies.

In order to address these barriers, our researchers made a series of recommendations:

- Use a wider range of teaching materials and methods matched to patients preferred learning styles and reduce the amount of time spent on information-giving by providing it to patients ahead of pre-dialysis sessions.
- Take a more individualised approach to pre-dialysis education, including a two-way exploration of treatment options and considerations of psychological and emotional barriers to home therapy.
- Provide emotional and psychological support to patients during the transition to dialysis.
- Provide opportunities for patients to engage in the decision-making process earlier on in the chronic kidney disease pathway.
- Provide basic home therapy training to all renal staff and encourage staff to see it as part of their role to talk to patients about treatment options.
- Provide self-care opportunities in haemodialysis units and review patient choice of treatment.

Between 2010 and 2012, the study sites increased the uptake of home therapies by 1.8-10.5% compared with rates in the rest of England, which remained static.

Working with patients and the public



CLAHRC-BBC has established a group of voluntary lay advisors to help shape its programme of research as part of its patient and public involvement (PPI) activities. While a PPI member's own health-related experience may encourage them to participate, involvement is not restricted to patients, and people can give as little or as much time as they can spare. We have established both a PPI panel and a PPI forum; members of the panel act as 'critical friends', advising on the development of PPI in our research activities, while the forum discusses PPI more generally and puts it into practice within our themes. Additionally, we have recruited a PPI officer to engage patients and the public in our research and recruit PPI volunteers.

Because our region is culturally diverse, we encourage involvement from diverse ethnic communities to give us a holistic and balanced view of service needs and we have recently begun working with the region's lesbian, gay, bisexual and transgender community through Birmingham's LGBT Health and Wellbeing Centre. Tailoring our approach to individual organisations, we aim to work with their members, rather than replacing any existing patient groups. We have 'tapped into' the Cross City Clinical Commissioning Group's PPI forum and are collaborating with other NHS service providers, such as Birmingham Community Health Trust, to translate our research findings into clinical practice.

Our innovative Public and Researchers' Involvement in Maternity and Early Pregnancy (PRIME) group – one of the first of its kind in the country – is open to women and men with previous experience of using maternity services. Established in collaboration with a consultant from Birmingham Women's Hospital NHS Foundation Trust, PRIME's aim is to produce robust, relevant evidence around the quality, access and organisation of maternity services. We are also engaging effectively with young people through the Youthspace programme, which focuses on youth mental health issues. This has enabled us to plan, gain feedback and develop ways of increasing awareness and reducing the stigma of mental health issues, as well as devising ways of delivering treatment in schools.

"Everyone should be able to understand their healthcare, so our PPI work is about demystifying research. We want to produce evidence to give people the knowledge and information they need," explains Dr Sabi Redwood, Research Fellow in Medical Sociology.

Working with patients to reduce the stigma and improve understanding of psychosis

'Birmingham Youthspace' is the new mental health service for young people and is directly guided and supported by a group of service users who have come together to form the Youth Board. The Youth Board has 25 active members and is currently working on around 25 projects. We highlight some successes below:

- Development of the website www.youthspace.me
- Members of this Board supported the development of a new in-patient ward for people with eating disorders. They were involved with interviewing staff, staff inductions and produced a film to demonstrate the ward virtually for potential service users and new staff.
- They have established collaboration with the Prince's Trust and have placed a secondee to broker knowledge across organisations.
- A number of films to raise the awareness of psychosis in young people have been produced. Including a short film on the experience of hearing voices, written by young people. For further information see http://www.youthspace.me/Psychosis/PsychosisMedia.aspx
- Following a successful knowledge-exchange forum run by CLAHRC, the Board have been awarded £40,000 to create a training package to improve services for people with ADHD.
- This dynamic group of volunteers are hosting a workshop at the International Youth Mental Health Conference - 'Young people at the forefront of reshaping services' in September 2013.

The creation of the 'Youth Board' was a joint CLAHRC / Birmingham and Solihull Mental Health Foundation Trust initiative and the relationship continues to evolve as the recognition of the importance and value of service-user involvement in all aspects of service redesign has become more apparent.

Patient safety research video wins national competition

CLAHRC Researchers from University Hospitals Birmingham NHS Foundation Trust (UHB) and the University of Birmingham have secured the top spot in a national competition.

A video produced by a team examining the importance of information technology in patient safety won first prize in the National Institute for Health Research (NIHR) Media Competition 2013.

The aim of the competition, which was open to all NIHR-funded researchers, was to create a video to enthuse people about research.

The film's narrator, Dr Jamie Coleman, Senior Clinical Lecturer in Clinical Pharmacology and Medical Education at the University of Birmingham and UHB, describes how research is tackling the challenge of keeping track of patients' data on a daily basis and explains how it covers a broad spectrum of healthcare improvement and innovation.

The video took the viewer on a journey through the hospital to demonstrate how IT is crucial throughout the prescribing process.

The six-minute film, 'Improving patient safety with information technology', was filmed at the Queen Elizabeth Hospital Birmingham.

Increasing the public's understanding of science

Scientists and patient and public representatives were brought together at an event aimed at boosting the public's understanding of science.

Hosted by CLAHRC-BBC, the 'Patient and Public Engagement Intellectual Summit' on 17 October 2012 provided a valuable opportunity to share ideas about the science of engaging the public and how to incorporate this into health services research.

Alice Roberts, Professor of Public Engagement in Science at the University of Birmingham and broadcaster (pictured with CLAHRC-BBC's Professor Richard Lilford), set the scene, laying out why there should be a better understanding of science.

She explained: "There is a need to convey complex information in a way that's accessible to general audiences."

Asked why people should have to understand science, she added: "We have moved from public understanding to engagement to get to the point we can have a meaningful dialogue. People can't give opinions if they don't understand."

The importance of understanding risk and statistics was highlighted by Dr Wolfgang Gaissmaier, Chief Research Scientist at the Max Planck Institute for Human Development and the Harding Center for Risk Literacy in Berlin. His presentation prompted discussions around whether knowing the possibilities associated with an illness was as important as knowing the probabilities.

Professor David Spiegelhalter, Winton Professor of the Public Understanding of Risk at the University of Cambridge, spoke about communicating variability, stating that the method of communication is vital and statistics should be provided in a transparent format that aids interpretation.

Speaking about study design, bias and randomisation, Professor Richard Lilford, explained how randomisation can be a difficult idea to grasp and explored whether providing patients with more or better information can lead to a better understanding and lower acceptance of participating in clinical trials.

Following this event a public engagement in science study development group took place at the University of Birmingham in March 2013. The study group brought together colleagues from CLAHRC-BBC, Peninsula CLAHRC, Brunel University, Warwick University and the Max Planck Institute for Human Development to further progress health services research ideas around engaging the public in science.

News in Brief

Our stroke theme have been attending stroke support group meetings held by the Stroke Association to engage with and understand stroke survivors' experiences, particularly around the issue of communication. Attendance at these meetings identified the need to raise public awareness of the initial signs of stroke and transient ischaemic attack in primary care. Therefore, with contribution from the theme's Patient and Public Involvement (PPI) representatives, an additional study has been funded to understand GP practice reception staff ability to identify patients with stroke symptoms and assist them in seeking appropriate care, and aims to design a receptionist stroke symptom protocol and inform receptionist training sessions. Furthermore, a GP receptionist has been recruited as another PPI representative for this study and has been invaluable in assisting in the study design and study documentation

The future for the West Midlands

We are delighted to report that the West Midlands has been successfully awarded a further £10million from the National Institute for Health Research to continue evaluating and developing health services over the next five years. The great attraction of this award is that the NIHR funding complements the NIHR contribution with £20.6million matched funding from local health and social services.

The CLAHRC for West Midlands (CLAHRC-WM) is a partnership between local health services, universities, and local authorities with one purpose: to improve the services we deliver focusing on four crucial areas of health:

- Health for Mothers and Children;
- Mental Health;
- Care for Long Term Conditions;
- The Prevention of Disease.

CLAHRC-WM's mission is to create lasting and effective working relationships and an environment where close collaboration is the rule, not the exception. This work is supported by new scientific ways to measure the impact of changes and to make sure the best care is spread so that it can be delivered everywhere. In five years, the outcome should be better health, a better prospect of staying healthy, and a service in which every pound of the public's contribution goes on services that use the best evidence of what works.

We look forward to helping evaluate and develop services in collaboration with our Academic Health Science Network and would like to thank all our collaborators for their support in achieving this prestigious funding award.

CLAHRC for Birmingham and Black Country would like to thank all our collaborators in helping to make service change possible:

University Hospitals Birmingham NHS Foundation Trust
Heart of England NHS Foundation Trust
Birmingham Women's Hospital NHS Foundation Trust
Birmingham Children's Hospital NHS Foundation Trust
Birmingham & Solihull Mental Health NHS Foundation Trust
Sandwell and West Birmingham NHS Trust
Walsall Hospitals NHS Trust
Sandwell Metropolitan Borough Council
Worcestershire County Council
Ideal for All—Sandwell Independent Living Centre
West Midlands Ambulance Service
Birmingham Midland Eye Centre
Moseley Hall Hospital
University of Birmingham
University of Aston
The Stroke Association
Former Primary Care Trusts including:
Heart of Birmingham Teaching Primary Care Trust
Sandwell Primary Care Trust
South Birmingham Primary Care Trust
Birmingham East and North Primary Care Trust
Solihull Primary Care Trust

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