



National Institute for
Health Research

**NIHR Collaboration for Leadership
in Applied Health Care
(CLAHRC) West Midlands
Annual Report Year 4
April 2017 – March 2018**



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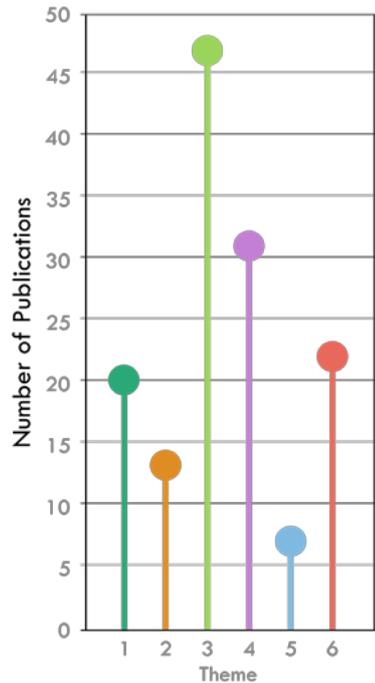
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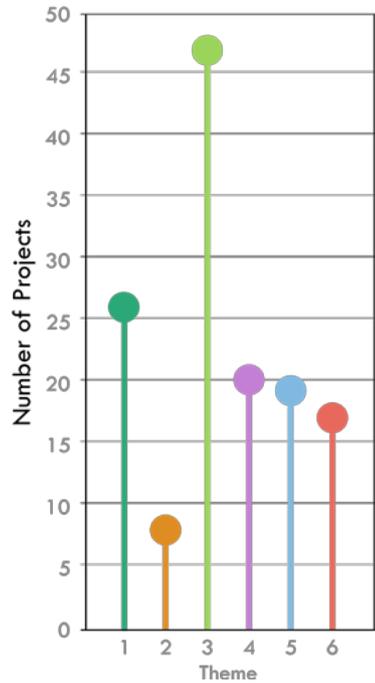
46 Publications

£13,728,289 External Funding	139 Publications	134 Projects	54 Students	83 Staff
£1,991,403 Expenditure		6 BITEs	14 Advisors	
24 News Blogs	1,645 Subscribers	127 Tweets	1,742 Twitter Followers	
		400 Likes	97,300 Twitter Impressions	

Our Outputs



Our Funding



Our Team

15	68	NIHR Associates
54	14	NIHR Investigators
		NIHR Trainees
		PPI Advisors

Overview of Activities

We have progressed well against the objectives set out in our original bid, and our metrics defined by the Finance and Activity Report. We have improved our key relationships over the last year to lay a strong foundation for any future bid for NIHR applied health research infrastructure. This has included extensive meetings with NHS organisations (those who are part of CLAHRC WM and those who may wish to become involved in the future); Patient and Public Involvement and Engagement (PPIE) representatives within and outside of CLAHRC WM; and complementary and synergistic groups, such as the West Midlands Academic Health Science Network (WM-AHSN).

There is an exciting range of work scheduled for the next 12 months and we look forward to continued engagement with our partners as we shape our ideas into the component parts of a future infrastructure bid. This will be complemented by our ongoing development of other externally-funded projects for which we have such a strong track record of success.

Throughout the past year we have sought to remain true to the IDEaL (*Identify, Develop, Evaluate and Lead*) Framework detailed in our original bid (and shown below). This framework identifies the range of activities across the breadth of CLAHRC WM and provides a structure to help us ensure that we are delivering robust evaluation of service improvements. The individual reports from our themes set out the detail of how all elements of the framework have been delivered.

Short-term objectives to identify and develop projects:

We continue to have close relationships with our local NHS and local authority providers, as well as our local STPs. Consequently we constantly receive ideas for the initiation of new research that, where possible, we seek to respond to and integrate with our existing work streams.

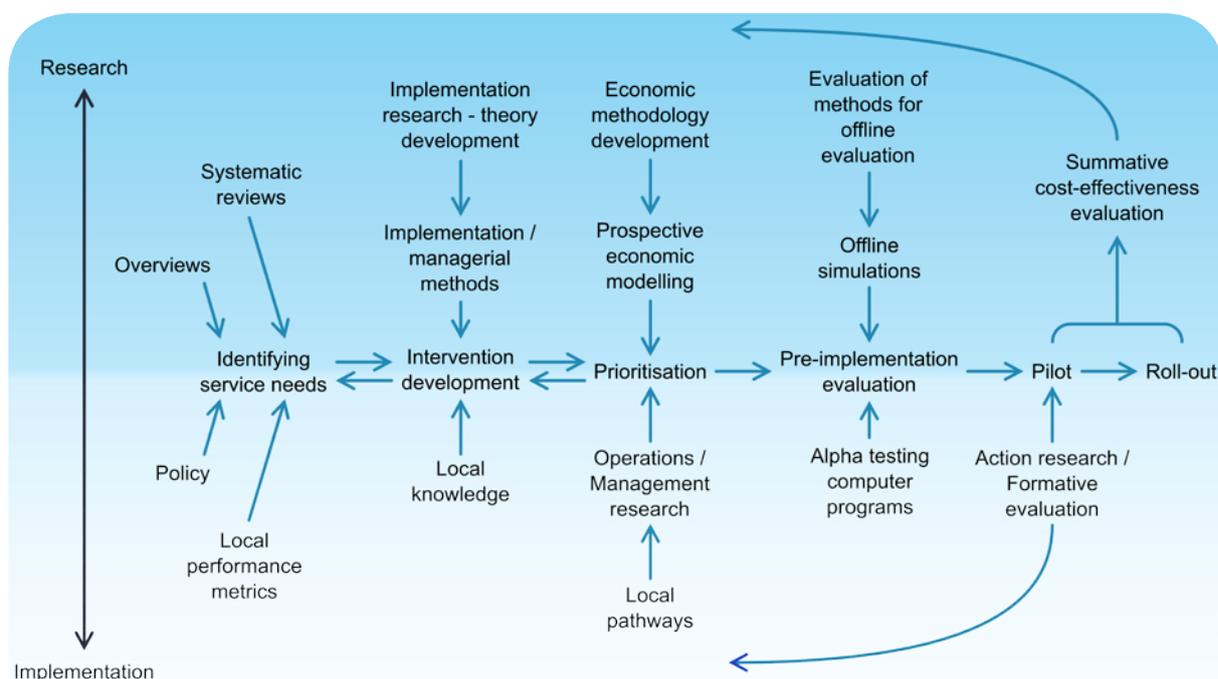
Within our **Maternity and Child Health theme (1)** we have responded to provider concerns regarding how quickly women are discharged from hospital after giving birth by initiating a project examining the effects of very early hospital discharge on women, babies and health professionals (page 10).

Our **Youth Mental Health theme (2)** has begun a new project examining resilience in school children in partnership with Public Health England as a result of ongoing dialogue and collaboration (page 16).

After previous research caused the NHS to decommission specialised weight loss services, our **Prevention and Detection of Diseases theme (3)** continues to work in this important area. We are undertaking a new study to look at the factors that influence weight loss for participants in commercial weight loss programmes, so that this approach can potentially be optimised (page 20).

There is strong focus on the delays to hospital discharge and the work of our **Chronic Diseases theme (4)** (alongside a local acute hospital) on the Supported Integrated Discharge programme is highly topical at present (page 24).

The IDEaL Framework



The embedded researchers we have within our **Implementation and Organisational Studies theme (5)** play a key role in identifying changes in front line service delivery and, where necessary, escalating them quickly up the research agenda for potential evaluation (page 31).

We have initiated new projects with the Nuffield Trust and Professional Record Standards Body through our **Research Methods theme (6)** as a response to service change and need in a time of significant reorganisation within healthcare. Ongoing work with NHS Improvement is resulting in more hospitals using statistical process control charts to analyse their quality and safety data in board reports (page 35).

Medium-term objectives to evaluate:

We have consolidated our reputation as national leaders in complex evaluation.

Our evaluation of the Birmingham and Solihull United Maternity and Newborn Partnership through our **Maternity and Child Health theme (1)** will evaluate regional change across multiple providers (page 11).

The evaluation of the 0-25 youth mental health service by our **Youth Mental Health theme (2)** will have important implications for the implementation of this increasingly popular model (pages 6 and 16).

The five Cochrane reviews published this year by our **Prevention and Detection of Diseases theme (3)** highlight our commitment to high quality research across a broad subject area (page 20).

The Safer Provision And Care Excellence (SPACE) programme (page 26) being undertaken by our **Chronic Diseases theme (4)** is the sort of complex evaluation at which CLAHRCs excel, targeting an under-researched area where there is potential for significant efficiency and safety gains.

The evaluation of the NHS partnership with the Virginia Mason Institute by our **Implementation and Organisational Studies theme (5)** is a project of national reach and importance (page 30).

The evaluation of potential reasons for an increase in mortality for weekend hospital admissions by our **Research Method theme (6)** addresses a continuing high-level national debate around patient safety, while analysis of the uptake of Health Technology Assessment findings will provide a new challenge for implementation science (pages 34-35).

Long-term objectives to lead:

We continue to offer both local and national leadership on a range of topics, from specific interventions through to research methodology. The development, implementation and evaluation of the Birmingham Symptom-specific Obstetric Triage System through our **Maternity and Child Health theme (1)** and **Implementation and Organisational Studies theme (5)** is being picked up at national level, and is an example of leadership on research in a key area of patient safety and quality (page 12).

The ongoing work of our **Youth Mental Health theme (2)** with the Cabinet Office (page 16) is helping shape national policy and waiting time standards for mental health care nationally.

The Social Care Summit convened by our **Prevention and Detection of Diseases theme (3)** has offered important system leadership in identifying knowledge gaps in the formulation of the Coventry and Warwickshire STP. This in turn has led to the development of an evaluation of Coventry's Out of Hospital Care model by our **Chronic Diseases theme (4)**, which is a key part of the STP and will potentially have important learning for the many other STPs seeking to establish similar models of care.

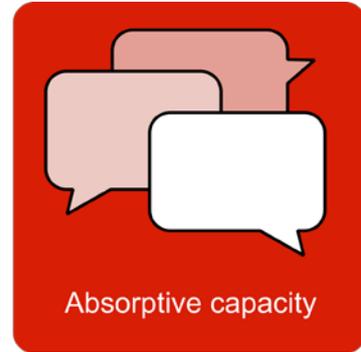
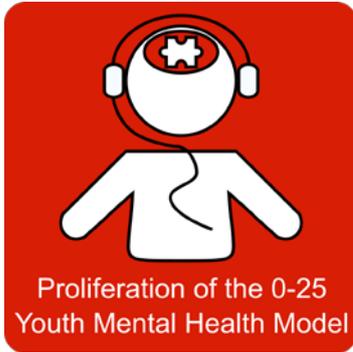
Our Director, Professor Richard Lilford, was awarded a CBE in the Queen's New Year's Honours list, in recognition of the strategic leadership he has offered to health research in the West Midlands.

Strategic Changes:

Our main strategic change during 2017/18 has been to align ourselves more closely with the six STPs within the region, and to work even more closely with NHS service delivery organisations through our continued joint working with the WM-AHSN and their Membership Innovation Councils (MICs). Our new collaborations with the Nuffield Trust and the Patient Standard Records Body (see page 35) demonstrate our response to the call for greater national impact from CLAHRC outputs.

Impact on Healthcare Provision and Public Health:

Our work continues to have significant impact at regional and national level in terms of both implementation and policy. There are numerous projects throughout this report and the Case Study examples of added value that have had an impact on national policy or are actively shaping it at present through their work.



Top Achievements:

1. Proliferation of the 0-25 Youth Mental Health Model

The 0-25 Youth Mental Health model grew out of work by CLAHRC Birmingham and the Black Country and then by CLAHRC WM. Following its launch as Forward Thinking Birmingham (FTB) in April 2016 it continues to be widely influential (see page 16). The model, or elements of it, have been adopted both regionally (Birmingham, Coventry, Shropshire, Telford & Wrekin, and South Staffordshire) covering a population of over 2 million people, and nationally (the Wirral, Norfolk, Durham, Southampton, Kent, Salford City, and Hackney). At a strategic level the model has been highlighted within the Royal College of Psychiatrists' report "*Good mental health services for young people*" as an example of service redesign.

Perhaps unsurprisingly for significant service redesign there have been some implementation challenges over the first two years of service in Birmingham, but we have been leading the evaluation of its implementation, and recently delivered a 100 page initial report on the service, along with a set of recommendations to increase effectiveness.

Following the regional profile of mental health, the West Midlands Combined Authority has established a mental health commission that includes CLAHRC WM's Professor Swaran Singh, to look at mental health evidence from around the world to influence regional policy. The commission is currently researching the impact of mental health on the public sector.

At a national level, our **Youth Mental Health theme (2)** and **Implementation and Organisational Studies theme (5)** have been working with the Cabinet Office to inform policy with research evidence, resulting in a research fellow from Warwick Business School being embedded in the Cabinet Office. A one-day symposium was also held at Warwick Business School's Shard Campus in London with the Cabinet Office in September 2017 to help inform the Green Paper on "*Transforming children and young people's mental health provision*".

2. GRIPP2 - New guidance for reporting patient and public involvement in research

The first international guidance for reporting patient and public involvement (PPI) in research has been co-published in the BMJ ^[117] and in Research Involvement and Engagement.^[118] This work was led by CLAHRC WM's Professor Sophie Staniszewska in collaboration with EQUATOR and others (Andrew Entwistle, a CLAHRC WM PPI Advisor, was also a co-author on the paper). This guidance will improve the quality, consistency and transparency of the evidence-base on public involvement and ensure future public involvement is based on best practice.

Guidelines for Reporting Involvement of Patients and the Public (GRIPP2) is built on a number of systematic reviews that identified the often inconsistent reporting in papers of involvement and engagement – researchers did not always report public involvement, or they only partially reported it, providing a limited understanding of what had happened in a study and impacting on the quality of the paper. Collectively, this lost information has a significant impact on any evidence-base regarding public involvement, limiting the extent to which practitioners can use it to inform their practice.

For GRIPP2, international consensus was developed about what kind of information should be reported for involvement and engagement. Two versions emerged from the process:

- A short-form version suitable for any study.
- A long-form version suitable for studies with a primary focus on patient and public involvement.

Our central role in this critical research places our researchers at the forefront of PPI development, driving change and improvement in this key area.

3. Absorptive Capacity

Our work on absorptive capacity is increasingly the focus for driving change, as it provides a theoretical and practical framework for understanding how organisations assimilate and utilise information. The development and diffusion of extended integrated care models that spread beyond hospitals and healthcare itself, places a demand on institutions of all types to keep up with new developments. Their ability to do this is determined by “absorptive capacity”: whether institutions are able not just to acquire information, but also to analyse it, transform it into decision-making, and exploit the results.

An organisation needs to have a number of capabilities present in order for change to be effective:

- Systems in place that facilitate knowledge-sharing and feedback.
- The ability to co-ordinate activity across all levels of its workforce.
- To be socially attuned to its workforce, which is defined as trust and emotion: a less tangible quality but a key element where all staff feel that their views are of value, and that they have a sense of ownership and an ability to take charge, share knowledge and reflect on it.

The transformation of these concepts into a practical tool for measuring absorptive capacity has been a major achievement for our **Implementation and Organisational Studies theme (5)**.

Underpinned by 120 qualitative interviews from 12 Clinical Care Groups (CCGs), the tool is designed to make research results accessible and useful to these organisations, as well as adaptable for different contexts. It also provides norms for comparison, enables CCGs to learn from each other, and provides the basis for improvement within a CCG.

The significance of this work in expressing and measuring the institutional qualities that enable them to embrace complex new ways of working has been highlighted by NHS RightCare and we are currently in collaboration with them regarding the wider dissemination of the tool

CLAHRC WM Themes





Theme 1: Maternity and Child Health

Lead: Prof Christine MacArthur
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20
Papers

26
Projects

£1,711,256
External funding

£404,208
Expenditure

Research Highlights:

The outcome of the BUMPES (Birth in the Upright Maternal Position Epidural in Second stage) randomised controlled trial was published in the BMJ [17] and issued as an NIHR Signal. We found that lying on one's side during labour with an epidural is safe and leads to more spontaneous births.

The evaluation of the Birmingham Symptom-specific Obstetric Triage System (BSOTS), which was developed, piloted, evaluated and rolled out within the West Midlands at four acute hospitals, was published by BMC Pregnancy and Childbirth.[14]

Implementation Highlights:

Regarding the BSOTS, we held a consensus meeting that was chaired by the Director of the Birmingham Clinical Trials Unit, and attended by representatives from the Royal College of Obstetricians and Gynaecologists (RCOG), the National Maternal and Neonatal Health Safety Collaborative, service users, PROMPT (PRactical Obstetric Multi-Professional Training in obstetric emergencies), West Midlands Clinical Networks & Clinical Senate, and Warwick Business School. It was agreed that no further evaluation was required and that the team would explore the next phases of roll-out, with the main driver being increased safety for mothers, babies, and clinicians.

National implementation of BSOTS is now supported by the RCOG and the Royal College of Midwives. Further, it is included by the National Maternal and Neonatal Health Safety Collaborative, as well as locally by maternity Clinical Networks and the West Midlands Academic Health Science Network. Three further trusts have been trained on the tool ready for implementation in early 2018, while a further six trusts have expressed an interest in adopting the tool.



Two local Trusts have agreed to implement the Place of Birth intervention package.

Strategy Initiated, New Activity and Major Grants:

We are currently in the early phases of working with medical software company *Clevermed* to develop an interactive electronic version of the maternity triage system.

A study of maternal and infant readmissions using health service information systems is being set-up to examine the effects of very early hospital discharge on women, babies and health professionals.

We are developing research to support families with children who have medical complexity, including a requirement for palliative care.

Prof Christine MacArthur (theme lead) is a co-applicant on a national study 'Longitudinal study of pelvic floor dysfunction, and its relationship with childbirth', funded by the Chief Scientific Officer for Scotland.

Prof Sara Kenyon is a co-applicant on a national study 'MNI-CORP Maternal and Perinatal UK surveillance data and confidential enquiries', funded by the Healthcare Quality Improvement Partnership.

Leadership:

Prof Christine MacArthur continues to lead the theme, collaborating with Prof Sara Kenyon, who is also an NIHR Training Lead for Midwifery.

Examples of Impacts on Health & Wealth:

The Midwives Research Forum continues to be well-attended, ensuring that evidence-based best practice is promulgated across the West Midlands (see also page 42).

Eight licence agreements were renewed for 2017/18 for training materials relating to the BSOTS and Place of Birth studies.

Progress, achievements and challenges against objectives:

Short-term objectives:

- BSOTS is currently being used by Birmingham Women's and Children's NHS Foundation Trust, and an enhanced training package is underway. A further six units are keen to implement the system.
- A systematic review of outcomes for mothers of early hospital discharge and readmission is in progress.
- A protocol for a mixed-methods and before and after study has been published for the evaluation of electronic prescribing with bespoke paediatric decision support.
- Qualitative interviews have taken place with Advanced Care Plan co-ordinators.
- An intervention to reduce children's exposure to passive inhalation of tobacco smoke is being developed.

Medium-term objective:

- Improvement of the pathway for maternal request for caesarean section has been completed, in response to patient experience of repeated challenge about this option.
- Initial evaluation of the Place of Birth intervention package has demonstrated improvements in midwives' knowledge, leading to its adoption in other local Trusts.
- Evaluation of the Birmingham and Solihull United Maternity and Newborn Partnership (BUMP) study continues.

Long-term objective:

- A mixed-methods evaluation of a new facility at Birmingham Children's Hospital that supports parents of children undergoing palliative care is underway.
- We are developing research to investigate and aid families of children with medical complexity.





Birmingham Symptom-specific Obstetric Triage System (BSOTS)

Unlike mainstream emergency medicine, there is no standardised triage system within maternity for women who attend for unscheduled appointments. Women are usually seen in order of arrival, which can result in delays. This lack of clinical prioritisation can also cause safety issues as women who need urgent care may be seen after those with minor concerns. The Birmingham Symptom-specific Obstetric Triage System (BSOTS) was co-produced in 2013 by midwives and obstetricians from Birmingham Women's and Children's NHS Foundation Trust and researchers working on the **Maternity and Child Health theme (1)** at the University of Birmingham. The system is based on established triage systems in emergency medicine and uses an assessment with clinical prioritisation of the common reasons that present within maternity triage.

An initial standardised assessment of each woman identifies her presenting condition, key clinical symptoms, and physiological indicators. Symptom-specific prioritisation algorithms use this information to define the level of clinical urgency using a four-category scale: green (non-urgent), yellow (requires further assessment), orange (priority), and red (emergency).

Initial evaluation of the implementation of this system suggested increases in the numbers of women seen within 15 minutes of arrival, reduction in the time spent waiting for assessment, and reduced interval between attendance to medical review for those requiring it. Numbers of women who re-attended,

and when they were next seen by maternity services, suggested validity and improved safety. The system had excellent inter-rater reliability and midwives felt it improved safety for mothers and babies, and improved the organisation of the department.

There has been considerable interest in this triage system. The first of three training days for BSOTS has taken place, attended by clinicians from Heart of England, Worcester and Southampton NHS Trusts. Our researchers were instrumental in setting up and delivering the training, as well as organising the overall programme of events. The provision of such workshops is critical as it enables full training to be given with participants able to discuss how cases might be handled and how different scenarios might be managed. Further, the willingness of clinicians to devote time to attending the training indicates a commitment to employing the system as effectively as possible.

Two further training days will take place later in the year, and there has been interest from maternity units in other parts of the UK, as well as Australia and New Zealand, indicating that this research has an international reach. Professor Sara Kenyon has recently returned from a visit to these countries where she had the opportunity to discuss the system in more detail with stakeholders.

Obstetric Anal Sphincter Injuries (OASIS)

Despite the number of women who experience ongoing physical and psychological complications resulting from Obstetric Anal Sphincter Injuries (OASIS) and Anal Incontinence (AI), there is currently no national structured process of assessment and care pathway for these women and health professionals to access necessary specialist care. There is a need to map current service provision for women who sustain OASIS or AI, both for immediate care following the birth and for access to specialist referral for ongoing symptoms. Such information is necessary to inform nationwide NHS service improvement and referral pathway development; to alleviate unnecessary worry for women and clinicians; and to increase healthcare efficiency by streamlining services to women at actual risk of ongoing complications. This will also help reduce financial burden on the NHS by avoiding the costs of long-term treatment. A nationwide understanding of OASIS service provision will also afford an opportunity to develop a collaborative research group to allow future UK-wide cohort studies to be undertaken, and provide higher level evidence on the longer term outcomes of OASIS and AI.

Midwife Sara Webb (lead researcher) aimed to map and describe services that are provided across all NHS Trusts for women with OASIS/AI and to provide a comprehensive understanding of the services, referral pathways, and degree of variability currently available. Online questionnaires were sent to all NHS Trusts in England in order to survey OASIS and AI services, and from this inform nationwide service transformation and establish a collaborative network

of NHS Trusts for future OASIS/AI research. We supported the lead researcher throughout as the service developed.

A specialist perineal midwife network has also been established to advance discussion and research on the topic; our Midwives' Forum has been instrumental in helping dissemination.

Following interest expressed by Magarita Manresa, a midwife in Spain, we funded a visit to the hospital there to present the model and train staff, and this resulted in a continued collaboration. Following this, the first dedicated OASIS/Perineal Trauma Midwife-led clinic in Spain has been established, and now a second hospital is interested in setting up a similar service. A Spanish Specialist Perineal Midwife network has also been set up to join the UK group with the aim of improving OASIS and perineal trauma care and research internationally.

Sara Webb and Magarita Manresa in Spain are now collaborating on a grant application that, if successful, will fund a pilot study for testing a perineal wound assessment tool in both the UK and Spain as the first stage in a multi-site, international study.





Theme 2: Youth Mental Health

Lead: Prof Max Birchwood
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13
Papers

8
Projects

£2,377,138
External funding

£156,352
Expenditure

Research Highlights:

We completed data collection on the management of eating disorders at each stage of the referral pathway. We are collecting data from referrals after engagement within the Forward Thinking Birmingham (FTB) Eating Disorder Service. A short-term semi-structured interview is planned to provide qualitative evaluation of pathways in Eating Disorder Services.

We disseminated our findings that replicated the classic Patton study (identifying young people at high risk of eating disorders) at the International Young Person and Adolescent Mental Health Conference in Dublin, alongside three other presentations of our work. An article is being prepared for publication.

Following publication of a protocol and scoping review of literature regarding self-harm and suicide in primary school aged children, work has begun on the scoping review. It is hoped that this can be used as the basis of a full systematic review.

We are setting up a five year longitudinal assessment of resilience in school children from around 60 schools in Coventry. This is in partnership with Sue Frossell, a Public Health Consultant, and has been approved by the Coventry Executive of Head Teachers. Data collection starts in September 2018.

An evaluation report of Birmingham's new 0-25 Youth Mental Health service was conducted and completed by the group, which details recommendations to improve the existing service (see page 6).

Implementation Highlights:

The 0-25 Youth Mental Health model, which was developed, piloted, implemented and evaluated in the West Midlands, continues to have significant regional and national impact (see page 6).

This model featured in the report of the Royal College of Psychiatrists on "*Good mental health for young people*" where it was used as an illustration of how radical service redesign can be achieved.

"*Forward Thinking*", a recent themed review from the NIHR Dissemination Centre, looked at severe mental illness and featured two studies by our theme lead Professor Max Birchwood. One of these looked at the improvements seen by reducing the wait for a first appointment with a specialist for people with First Episode Psychosis. The results of this study have been instrumental in setting the national waiting time standard for this condition as part of the first set of waiting time standards for mental health.

Alongside the **Implementation and Organisational Studies theme (5)** we have developed strong relationships with the UK Cabinet Office and the Behavioural Insights Team (see page 6). This work has resulted in us leading a one day symposium for Cabinet Office staff and this, along with wider work,

has contributed significantly to the recent Green Paper on "*Transforming children and young people's mental health provision*".

Strategy Initiated, New Activity and Major Grants:

The West Midlands Combined Authority has established a mental health commission to look at mental health evidence from around the world to influence regional policy. Professor Swaran Singh from our theme is a part of this commission, and they are currently researching the impact of mental health on the public sector.

In conjunction with the WM-AHSN we have submitted an Innovate UK test bed application on Mental Health.

Professors Singh and Birchwood have continued their work in the West Midlands Partnership in Mental Health, which focusses on service transformation in youth mental health.

We have begun a new project examining resilience in school children in partnership with Public Health England as a result of ongoing dialogue and collaboration

Leadership: The research team have continued to operate at the University of Warwick after previously transferring from the Birmingham and Solihull Mental Health NHS Foundation Trust.

Progress, achievements and challenges against objectives:**Short-Term:**

- We have established a Centre for Mental Health Research and Wellbeing to act as the engine of public mental health innovation within the WM-AHSN.
- We have implemented pilot trials of two interventions on eating disorders and promoting resilience for looked after children in care.
- We have implemented a youth mental health dissemination event (see previous Annual report).

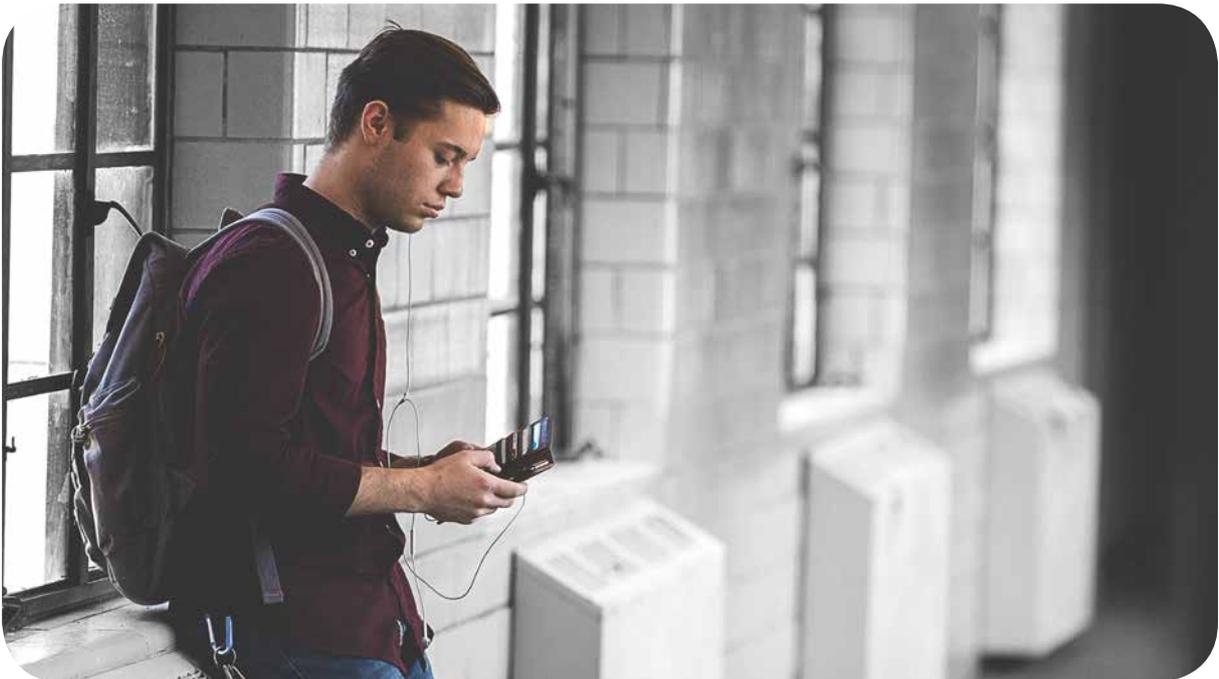
Medium-Term:

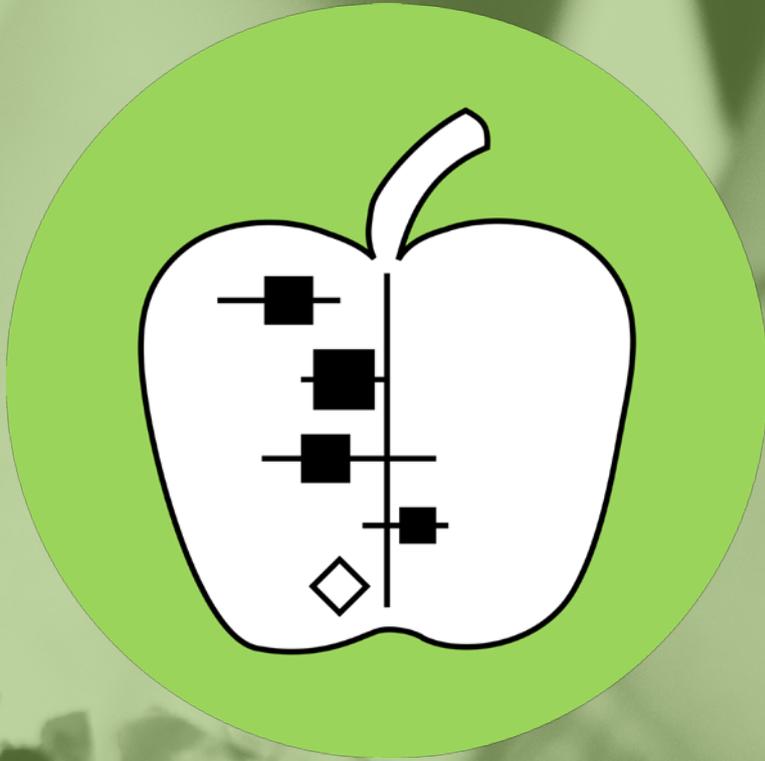
- We are planning a pilot study of the Long-term conditions, Young people and Network Communication (LYNC) study.
- We conducted an analysis of eating disorder care pathways in collaboration with FTB and two GP surgeries in Birmingham and Solihull. In addition we have collected internal data from FTB and from semi-structured interviews with patients with eating disorders.

- We continue to act as consultants assisting the creation and roll-out of *Shout Out to Youth Mental Health* events in Shropshire & South Staffordshire and Coventry & Warwickshire.

Long-Term:

- We continue to progress towards our long-term objectives.





Theme 3: Prevention and Detection of Diseases

Lead: Prof Aileen Clarke
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48
Papers

47
Projects

£2,555,878
External funding

£332,827
Expenditure



Research Highlights:

Our theme continue to have regional and national influence in the areas of Public Health and Health Screening Policy, and we have provided a range of systematic reviews and methodological advice to underpin public health policy generation.

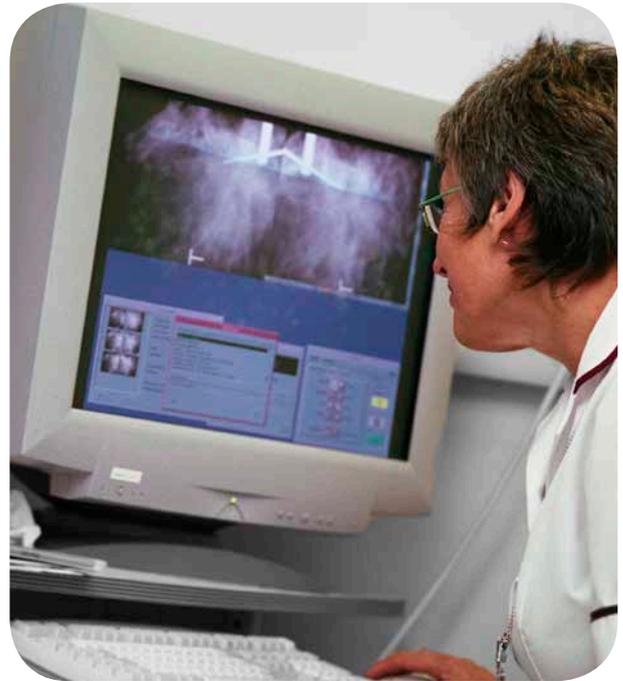
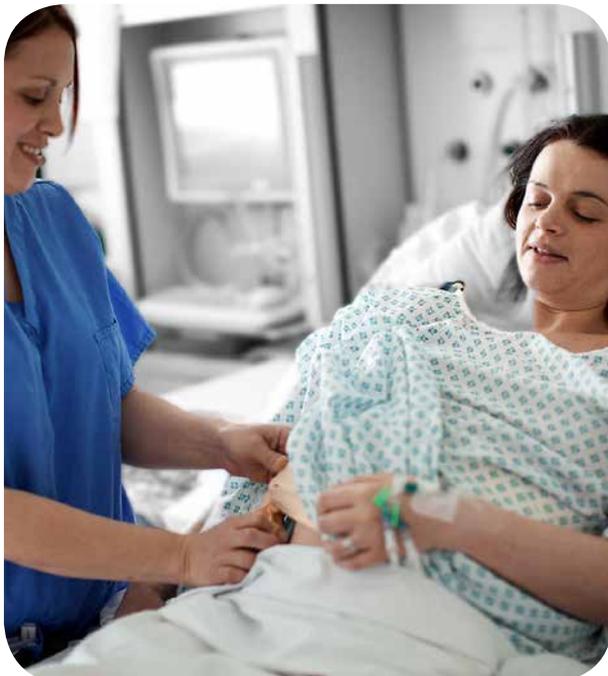
We published five major Cochrane reviews on cardiovascular disease and obesity, all of which have been widely reported in the news and amongst policy-makers.^[34, 39, 46, 56, 64]

We published several high impact research articles regarding the integration of primary and secondary care. Examples include: treatment of paroxysmal atrial fibrillation in UK primary care; statin initiations; and QRISK2 scoring in UK general practice.

Publications on innovative methods in applied health research included the development of methods to integrate mixed methods data, and the use of Qualitative Comparative Analysis to identify critical pathways for use with drug and antibody assays for predicting response to treatment in Crohn’s disease.

Implementation Highlights:

Two of our projects on the evidence base in Commissioning have been highlighted recently by the NIHR.



Our research on screening has directly informed national policy, highlights include: screening for Group B Streptococcus; and non-invasive prenatal testing for Downs, Edwards and Patau syndromes.

Our work for NICE includes ongoing work on interventions for relapsing remitting multiple sclerosis and on Guselkumab (a monoclonal antibody) for moderate to severe psoriasis. Both topics have resulted in important decisions by NICE, with implications for the entire NHS population and for other countries in Europe and Australia.

The findings of our primary research are now beginning to enter the public consciousness. We have undertaken a series of clinical trials, including ‘*Factors Influencing Weight Loss in Participants of Commercial Weight Loss Programmes: Implications for Health Policy*’, which has wide reaching implications for referral programmes in general practice across the county.

Strategies Initiated, New Activity and Major Grants:

Strengthened existing relationship with health and local authorities across the region and nationally with Public Health England (PHE) and the National Screening Committee (NSC). We have a ‘preferred supplier’ status for PHE within the West Midlands.

To support this increased activity the theme has expanded its methodological expertise and systematic review capability and capacity.

We have been awarded grants for Assessment of feasibility and acceptability of a brief routine weight management intervention for postnatal women (£372K); an NIHR Global Health Research Group on Global COPD in Primary Care (£1.92m); Research Design Service WM (£5.4m collaboration); Screening for mitochondrial trifunctional protein disorders (£62K); and Cost Effectiveness of Screening for Tyrosinaemia (£56K).

Leadership:

Professor Aileen Clarke has completed a successful term as President of the Society of Social Medicine, and has been appointed as a Trustee of the Picker Institute. Dr Chris Stinton and Dr Sian Taylor-Phillips have formally been appointed as advisors to the NSC as a result of the advice and input that CLAHRC WM has supplied to inform policy over recent years, including notably on Group B Streptococcus and Non-Invasive Pre-natal Testing (see also 2016/17 annual report), which has now manifested to become policy guidelines.

Examples of Impacts on Health & Wealth:

Major national keynote debate for PHE on research and action to improve Public Health led to a BMJ publication and a highly regarded podcast explaining the key issues.^[43]

The theme has continued to advise NICE on guideline generation for multiple sclerosis, drugs for psoriasis, and non-small cell lung cancer, and have undertaken a number of other technology appraisals for NICE.

Evaluation of a community-based lifestyle intervention in conjunction with a local authority to provide advice and support on healthy living, resulting in actionable recommendations for local authorities.

Health and Social Care Summit (June 2017) with key regional and national stakeholders to discuss health and social care. PPI Advisors were key in organising and contributing to this event.

Working with a local authority in the region (on social and emotional wellbeing and family resilience) in order to include a major service redesign of their Family and Lifestyles Services.

Research conducted with the **Implementation and Organisational Studies theme (5)** has been strongly featured in a recent NIHR Highlight on “*How Commissioners Use Research Evidence*” (see also page 30).

Progress, achievements and challenges against objectives:

The **short-term objectives** have all been achieved, as detailed in previous annual reports. In addition we continue to maintain and develop a prevention and detection network across the region, with links to wider prevention networks. This is a direct result of the outstanding Cochrane work that has been achieved, alongside close links to the NSC and NICE.

The **medium-term objective** to deliver three RCTs has now been achieved, with two follow-on studies under development. One of these builds on our systematic review to investigate the relative effectiveness of interventions for cardiovascular disease using novel methods.

The theme have progressed significantly with the **long-term objective** to complete RCTs and reviews for widespread dissemination, as demonstrated by our numerous examples of impact. Through our work with the NSC and NICE, national reach and impact has been achieved, as has service change in the NHS and local authorities.



Theme 4: Chronic Diseases

Lead: Prof Jon Glasby
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31
Papers

20
Projects

£2,535,115
External funding

£356,860
Expenditure

Research Highlights:

Two NIHR Programme Grants in key areas were short-listed after initial submission (opioid prescribing in primary care, and self-monitoring of gout).

Our research in polymyalgia rheumatica won an RCGP Research Paper of the Year award (Muller, et al. *Arthritis Res Ther.* 2016; 18: 200).

Evidence from our study on emotional and psychological support for renal patients has been provided to NICE for a review of guidelines for end-stage renal disease.

We are undertaking the first-ever evaluation of virtual outpatient consultations in the UK.

Implementation Highlights:

Work on the STarTBack screening tool continues to be well-received and has been heavily promoted by CLAHRC WM and WM-AHSN (see page 31). This now features in the NICE back pain guidance.

A Programme Development grant for an educational intervention to improve multidisciplinary primary care for older patients with multi-morbidity was particularly successful in engaging front-line staff, along with very strong PPI involvement through our CLAHRC PPI structures.

The Electronic Frailty Index (EFI), developed jointly between CLAHRC Yorkshire and Humber and CLAHRC WM won a prestigious Royal College of Physicians award for the development, validation and implementation of the index.

Strategies Initiated, New Activity and Major Grants:

The INCLUDE study (INtegrating and improving Care for patients with inflAmatory rheUmatological DisordERs in the community) has recruited its first participant and is now live in six general practices. This has received co-funding from the Haywood Foundation and is supporting a clinical PhD.

A new evaluation of Coventry's Out Of Hospital Care Model is being planned, to commence later in 2018. This care model is one of the priorities of the STPs and will transform how care is delivered.

The theme have been awarded a number of major grants: Rheumatological and inflammatory conditions as risk factors for self-harm and suicide, NIHR

(£31,900); Quantifying severity of chronic conditions in English Primary Care using the Clinical Practice Research Datalink, NIHR (£23,000); Doctoral Programme for Primary Care, Wellcome Trust (£5.6 million).

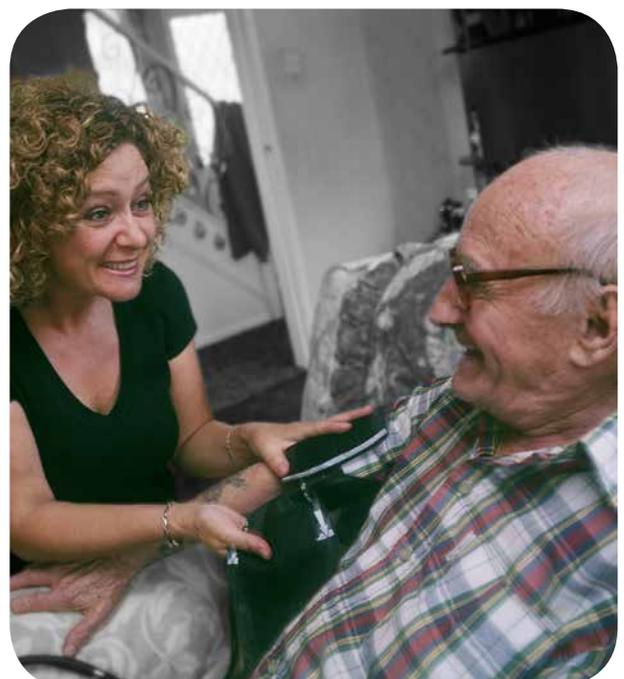
Leadership:

Dr Gill Combes at the University of Birmingham and Professor Christian Mallen at Keele University continue to provide academic leadership for this theme.

Examples of Impacts on Health & Wealth:

A collaboration between Keele University and Bristol Myers Squibb has resulted in the development of innovative mechanisms of detecting atrial fibrillation in primary care.

The Heartlands Elderly Care, Trauma and Ongoing Recovery (HECTOR) study for older people with multiple fractures won an award for 'Improvement project of the year' at the CRN West Midlands 2017 awards. It has also been short-listed in the Emergency Category for the BMJ awards 2018.





Progress, achievements and challenges against objectives:

Short-term:

- Analysis of the effectiveness of the Length of stay, Admission type, Co-morbidity, and Emergency department use (LACE) risk-prediction tool is now complete and the results have been published.
- The research into the West Midland's Patient Safety Collaborative (WM-PSC) Safer Provision and Care Excellence (SPACE) scheme has completed its first phase and the initial findings are currently being written up for publication.
- We are about to commence a study on understanding the prevalence of multi-morbidity in people of later working age and the impact of multi-morbidity definition on characteristics of the cohort.
- Pilot interventions designed to help physicians discuss emotional and psychological issues with End Stage Renal Disease patients have concluded and analysis is almost complete.
- Following successful completion of the ENHANCE study, investigating the detection and management of multi-morbidity in primary care, application for a full trial will shortly be submitted to Arthritis Research UK.

Medium-term:

- Recruitment has started for the Supported Integrated Discharge collaboration between CLAHRC WM and the Heart of England Foundation Trust; the study focuses on the discharge for longer-term patients.
- A randomised evaluation of the new University Hospitals Birmingham service of Virtual Outpatient Consultations is underway to assess if it can increase patient satisfaction and investigate its acceptability to patients and staff.
- Analysis of the two years' worth of pre-intervention data and two years' worth of post-implementation quantitative data is complete for HECTOR; further qualitative interviews with staff will commence shortly.
- Following the success of a feasibility study, HTA funding has been secured to undertake a larger study to investigate the effectiveness of thoracic epidural and paravertebral blockade in reducing chronic post-thoracotomy pain.

Long-term:

- We are commencing work on data analysis for the UK Biobank multi-morbidity study.
- We continue to build critical capacity in the core NHS priority area of primary care, through Keele University's membership of the NIHR School for Primary Care Research.
- We are leading the NIHR SPCR Capacity Building Programme (£10 million).





Safer Provision and Care Excellence (SPACE)

The Safer Provision And Care Excellence (SPACE) programme is an initiative from the West Midlands Patient Safety Collaborative (WM-PSC). Working with 32 care homes across two Clinical Commissioning Groups the aim is to improve patient safety by training staff in quality improvement techniques. Unusually, the programme seeks to equip staff to identify and then address risks (such as falls, pressure sores, etc.), rather than dictating which risks should be addressed. This broad remit makes evaluation challenging so we are conducting a mixed-methods review of the programme to assess how effective the training has been; how it has been implemented; how it has changed attitudes to safety; and what impact this has had on adverse events. Whilst it is still too early in the evaluative cycle to demonstrate changes to adverse events, it has already generated positive attitudes towards the programme and safety, while qualitative evidence shows it is having a demonstrable impact on safety. A recent Care Quality Commission inspection of community services in this area rated them as “outstanding”, specifically mentioning the SPACE programme: *“Staff told us, and we saw, that pressure ulcer incidence within private nursing homes had decreased and increased numbers of people were able to die in their care home where they had staff who knew them, rather than in an acute hospital.”* (CQC Report, May 2017).

The approach adopted by the SPACE programme, empowering care home managers and staff to identify and address risk, makes evaluation very challenging. Without the regional reputation and expertise of CLAHRC WM the programme might not have been evaluated, with the danger that any

benefits might be lost, which might adversely affect future implementation of this or similar approaches. It was always anticipated that there would be a positive reaction from staff to the programme, but this formal, independent evaluation should ensure that there is a strong and rigorous evidence base to support this work and so promote its future spread.

Year two of the evaluation is underway with one of the key aims being to improve the quality of data available on adverse incidents to allow a more accurate assessment of the effectiveness of the SPACE programme. The positive benefits already identified means there are plans to expand the programme to cover residential, as well as nursing homes, in Walsall and Wolverhampton, consolidating and developing the knowledge already gained through our evaluation. The fact that this work is now gaining significant recognition from NHS England and the Care Quality Commission suggests that it is well placed to expand implementation across both the region and nation. Further, there are initial discussions underway with WM-PSC about a SPACE 2 programme to further develop the model and expand its reach, including discussions to incorporate it within the Black Country STP programme.

STarTBack Screening Tool

The STarTBack stratification tool for lower back pain continues to have significant regional, national and international reach, with over 300 physiotherapists having been trained in the use of the tool in the UK alone.

As a result of being embedded within the local Sustainability and Transformation Proposal (STP), over 30 GP practices have now installed the STarTBack tool in North Staffordshire and Stoke-on-Trent, and we are working with the WM-AHSN to embed the tool within the other five regional STPs. Thirty-five further organisations have engaged nationally and 20 internationally to deliver stratified care for low back pain with the aim to identify further training resources for clinicians and patients. These collaborations include one of our existing industry partners, Kaiser Permanente in Seattle, as well as occupational health teams in British Airways.

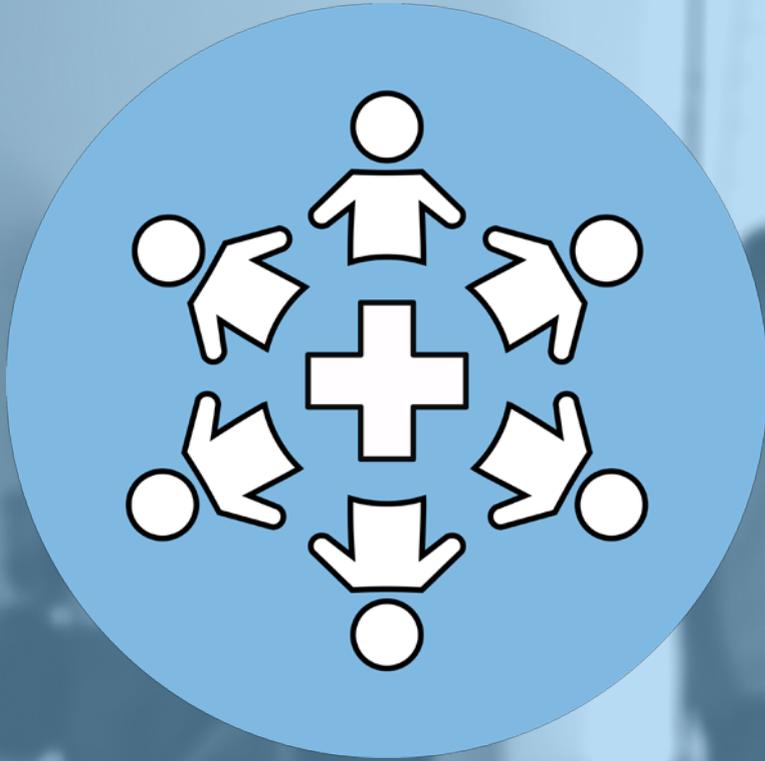
Over the last 12 months:

- The tool has been translated in to a further ten languages to support the international roll out.
- The tool has been incorporated in to the national German lower back pain guidelines, having already been adopted in to the NICE guidelines for low back pain in 2016/17.
- The tool has featured as a case study for Public Health England guidance on '*Productive healthy ageing and musculoskeletal health*', where it was highlighted as having a positive return on investment.

- The tool was included in a Lancet series on the global burden of lower back pain in 2018, as well as a number of other academic journals.
- An additional ten licence requests for the tool were received.
- An international course was delivered in Hong Kong in May 2017.

CLAHRC WM has played an important role across the lifespan of the STarTBack programme. Firstly, through helping to build the evidence-base and carrying out the economic evaluation of cost-effectiveness. Secondly, through supporting adoption and spread in our local region through our matched funding partners and in conjunction with the WM-AHSN. Thirdly, through highlighting this work nationally through the national CLAHRC network, central NIHR infrastructure, and the national AHSN network (where the tool was highlighted as one of the proposed implementations ready to be scaled by the AHSN Network following a joint national meeting with CLAHRCs in September 2017). Finally, through our international links we have helped promote the adoption of the model worldwide.





Theme 5: Implementation & Organisational Studies

Lead: Prof Graeme Currie
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7

Papers

19

Projects

£1,332,904

External funding

£259,926

Expenditure

Research Highlights:

Development in the area of digital healthcare at University Hospitals Coventry and Warwickshire NHS Trust.

Collaboration with Coventry and Warwickshire Partnership NHS Trust to support young adults with mental health problems.

The transformation of services to facilitate the delivery of traditional hospital services in the community with Sandwell and West Birmingham Hospitals NHS Trust.

The implementation of 'family hubs' at Coventry City Council that provide early intervention across domains, including health visiting, for at-risk families.

Implementation Highlights:

Evaluation of the NHS Partnership with Virginia Mason Institute.

There has been global interest in our Massive Open Online Course (MOOC) on the topic of healthcare leadership and innovation to assist those with clinical or healthcare leadership and management backgrounds.

Outcomes from the research on distributed leadership in the implementation of the Birmingham Symptom-specific Obstetric Triage System (BSOTS) at Birmingham Women's Hospital were used to inform an education package, which has been used in training sessions to midwives for wider implementation of the system (see also page 12).

Examples of Impacts on Health & Wealth:

Development of a toolkit to allow organisations, such as Clinical Commissioning Groups (CCGs), to benchmark their capabilities and capacities to acquire and translate knowledge into service improvement.

Collaboration with NHS RightCare for a wider dissemination of the above tool amongst CCGs.

Ongoing work with Coventry City Council using the toolkit to evaluate the organisational development of "family hubs" in Coventry.

Research conducted with the **Prevention and Detection of Diseases theme (3)** has been strongly featured in a recent NIHR Highlight on "*How Commissioners Use Research Evidence*". This included the work of theme lead Professor Currie on absorptive capacity, and is now being rolled out in conjunction with NHS England as part of their NHS RightCare programme to CCGs across the country.

Leadership:

The theme continues to be led by Professor Graeme Currie. He has been invited to join a group developing a "*Centre for Public Service Leadership*", convened by the Cabinet Office and HM Treasury, and chaired by Sir Gerry Grimstone. The group's findings will be reported through the 2018 Budget announcement.





Strategies Initiated, New Activity and Major Grants:

Evaluation of the impact of cultural investments made in Coventry on public health, linked to the City of Culture 2021 award.

Collaboration with Monash Medical School (Australia) in extending the CLAHRC way of working internationally to translational research initiatives.

Research with the Warwick-India-Canada Network is helping to transfer the CLAHRC way of working in the development of an early intervention around psychosis for youth mental health.

Development of a distance learning MSc in Strategic Leadership and Innovation in Healthcare is due to be launched in February 2019, addressing the complexity of change in healthcare settings.

The theme have been awarded a number of major grants: Department of Health and Social Care (£71,767); Evaluation of the NHS Partnership with Virginia Mason Institute; Health Foundation (£398,883); Role of Nurses in the delivery of quality care: understanding the workforce deficit; Medical Research Council (£22,347).

Progress, achievements and challenges against objectives:

Short-term:

- Implementation Research Fellows (IRF) from within the theme continue to support the main clinical themes with evaluation of clinical services.
- Eleven PhD projects are underway with data collection underpinned by the theoretical

construct of ‘absorptive capacity’.

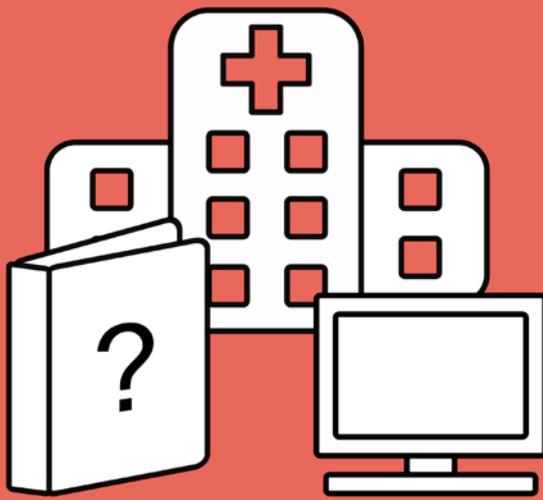
- Analysis is underway on an exploration of the roles and experiences of PPI advisors within CLAHRC WM.

Medium-term:

- The theme has successfully identified a wide range of applied research studies in conjunction with NHS partners, and 13 protocols were generated and peer-reviewed. The fieldwork has progressed well.
- The PhD projects and IRF protocols that have been developed will feed into the proposed evaluation of how absorptive capacity develops (or fails to develop) in health organisations using the ACAP psychometric tool to evaluate self-development.
- The model whereby researchers and PhD students from the theme are embedded within NHS organisations (e.g. UHCW, SWBHT, CWPT) continues to yield benefits. They work alongside clinicians and managers to conduct research with formative feedback arising from the implementation studies, allowing organisations to increase their ability to apply ‘new’ knowledge from research into routine practice in ‘real-time’.

Long-term:

- The implementation of projects undertaken thus far will give the required level of coverage to assess the spread of absorptive capacity across the CLAHRC WM footprint and beyond.



Theme 6: Research Methods

Lead: Prof Richard Lilford
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22
Papers

17
Projects

£3,183,619
External funding

£190,363
Expenditure

Research Highlights:

Completion of the NIHR Programme Development Grant on improving clinical decisions and teamwork for older patients with multi-morbidity in primary care through multidisciplinary education and facilitation.

A Lancet Global Health paper on appropriateness of clinical severity classification of new World Health Organization guidance for childhood pneumonia.

The work arising from the NIHR multi-morbidity award included a facilitated education programme for practitioners caring for older patients with complex multiple long-term conditions. The principles and theory behind the education programme have been endorsed by patients, staff and key stakeholders, and has led to a well-developed programme, which has been submitted as a full NIHR Programme Grant.

Implementation Highlights:

Our study into NHS boards' use of control charts to aid their discernment of signal from noise was identified by BMJ Quality and Safety editors as one of the ten most important papers in the journal for the year.

Research into user engagement with Computerised Physician Order Entry and computerised decision support for hospital prescribing informed national e-prescribing policy in 2018.

**Examples of Impacts on Health & Wealth:**

Research in collaboration with the NIHR ePrescribing Research Programme led to government investment of £75m towards the implementation of ePrescribing systems to reduce prescribing errors.

Development and publication of an ePrescribing toolkit for the NHS hospitals.

A new framework for developing the Health Economics of Service Delivery was published in February 2018. This was instigated and led by CLAHRC WM on behalf of the national CLAHRC programme, and is already challenging and changing some of the traditional approaches to health economics. It is hoped that it will result in better cost-effectiveness analysis of service delivery initiatives across the UK and beyond.

Strategies Initiated, New Activity and Major Grants:

A secondary data analysis has started to investigate common errors made by final year medical students on the Prescribing Safety Assessment.

A new project has been initiated in collaboration with the Patient Safety Collaborative at WM-AHSN to evaluate the Learning from Excellence programme and Appreciative Inquiry training (£45,465).

A systematic review is underway looking at methods to measure quality of healthcare, specifically focusing on low- and middle-income countries.

Major grants awarded to the theme include: NIHR Global Health Research Unit on Improving Health in Slums at University of Warwick, NIHR Global Health Research Programme (£5,686,768); NIHR MedTech and In vitro diagnostic Co-operative - Trauma Management (£800,000); Cognitive Behavioural Therapy: An overview of systematic reviews and meta-analyses, NIHR HTA (£394,583).

Leadership:

Professor Richard Lilford continues to lead the theme and was made a Commander of the British Empire (CBE) in the 2018 Queen's New Year's Honours List for his service to health services research.

Progress, achievements and challenges against objectives:

Short-term objectives:

- We continue to provide methodological expertise for the four service themes.

Current projects include:

- A systematic review on weekend effects and literature review on consultant effects to facilitate economic modelling (this has just been completed).
- Service quality improvements in weekend services on preventable mortality and adverse events.
- Logic models for patient safety interventions.
- Comparison of passing standards for written finals examinations in UK Medical Schools.
- An investigation into common errors made by final year medical students on the Prescribing Safety Assessment.
- An evaluation of the WM-PSC's Learning from Excellence programme and Appreciative Inquiry.

Medium-term objectives:

- Systematic review of publication bias in health services and delivery research.
- Systematic review on methods of measuring the quality of care in low- and middle-income countries.
- Evaluation of potential reasons for increases in mortality observed among weekend hospital admissions.
- A statistician has been jointly funded with CLAHRC East Midlands to undertake database studies on a range of topics, including the uptake of evidence following Health Technology Assessment studies.



Long-term objectives:

- We are collaborating with the Nuffield Trust and CLAHRC North Thames on a study to review the effectiveness of Sustainability and Transformation Proposals (STPs) and their development within the domain of strategic management. While it is unknown how STPs will develop, we know that some are likely to achieve significant service redesign and impact on health outcomes. We aim to look at models as they develop, compare performances, and provide rapid evaluation, feeding these formative findings back through workshops with STP leads (see also page 45).
- We are in the process of conducting a step-wedge cluster randomised trial of a service intervention to reduce falls in hospital, with the aim of publication in the future.
- We are collaborating with the Professional Record Standards Body to improve the timeliness and thoroughness of hospital discharge summaries, and thus increase primary care satisfaction. Through this national collaboration we aim to evaluate current practice, test elements of information that have the greatest impact, and help reshape documentation standards based on evidence and effectiveness (see also page 45).
- We are updating our academic review of the use of Statistical Process Control chart methodology by hospital boards, and hope that there will be the first evidence of changes in practice stemming from our previous detailing work.



Learning from Excellence (LfE)

The Learning from Excellence (LfE) programme is evaluating the impact of a patient safety and staff well-being intervention of positive incidence reporting. Patient safety has often been driven by learning from adverse events, but LfE seeks to also learn from incidents of excellence. This is underpinned by Appreciative Inquiry (AI) techniques. The idea is to improve safety and resilience, and improve staff morale in the process.

The LfE programme has been supported by the West Midlands Patient Safety Collaborative (WM-PSC) and the West Midlands Academic Health Science Network (WM-AHSN) since its conception at Birmingham Women's and Children's Hospital NHS Foundation Trust.

The programme has seen huge spread and adoption both nationally and internationally, with over 100 organisations now having LfE and over 250 delegates (from the UK and overseas) attending the first LfE conference in November 2017. Part of the reason for this rapid uptake is the firm belief of those who have been involved in implementation that it makes a substantial and tangible difference to both safety and morale. Our evaluation of the LfE programme will feature case studies from across the UK as we seek to fill the evidence gap between proven AI literature and the LfE intervention, and to provide data to confirm this.

The LfE programme has worked with the SME *Appreciating People* to develop specific healthcare focussed training in AI, which has already been delivered to over 250 NHS staff through training sessions based in the West Midlands. This new,

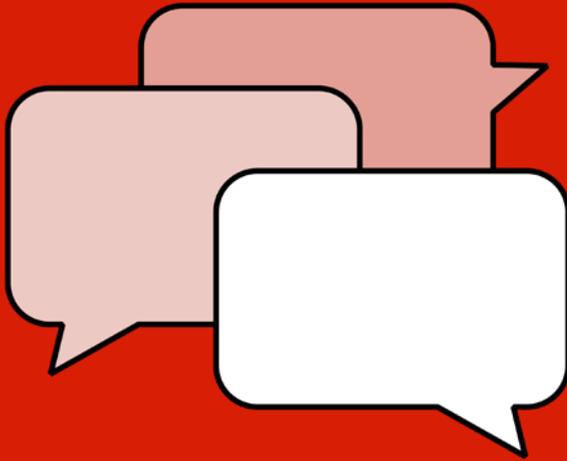
health-specific programme has also been supported by a book that helps those undergoing training to reflect on their practice and embed it within their workplace environment.

CLAHRC WM presented a poster of our logic model based evaluation protocol at the LfE Conference in November 2017, and qualitative data collection from case study sites is currently underway. The aim is to develop an evidence base to underpin what has been shown to be a popular intervention. We are keen to understand what it is about the positivity in the approach of this programme which has seen such wide and rapid take-up in comparison to other, better funded and supported approaches.

The LfE approach has been adopted by over 100 organisations internationally and the Conference in November 2017 included delegate from the USA, Finland, the Netherlands and Ireland. The LfE programme also won the prestigious Health Service Journal Education and Training Patient Safety award in June 2017 which has generated further interest. We will deliver a report on the programme in summer 2018, supported by academic publication.

The LfE programme has created a community of practice with an interest in patient safety and positive workplace culture, which the WM-PSC and CLAHRC WM plan to use to generate further research opportunities.





Patient and Public Involvement and Engagement

PPI/E Lead: Ms Magdalena Skrybant
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14 Advisors

We continue to work in close partnership with our 14 PPI Advisors, who report positive experiences of being involved in our research, and that their roles have developed and matured: *“We’ve come on such a long way. We’re more and more involved in research projects and researchers come to us early on, right when they’re just starting to form ideas. Because they’ve had good experiences of involving patients, researchers value us and respect our views.”*

Activities / Outcomes:

Our Advisors are involved in projects throughout the research cycle, and our researchers are seeking more innovative and creative involvement of patients and the public in their research. Highlights include:

- Prioritising future research areas. Advisors in our **Prevention and Detection of diseases theme (3)** participated in a Health and Social Care Summit in June 2017 where they presented, and contributed to discussions on the challenges of integrating care.
- Helping design research. In partnership with researchers, Advisors in our **Chronic Diseases theme (4)** are designing an education/facilitation intervention to improve the care for older patients with multi-morbidity.
- Helping implement research. Involvement of our Advisors ensured that aspects of triage important to women were enhanced.

PPI research continues to be productive - Dr Yaru Chen has completed data collection on the PPI Advisor Study; and Prof Sophie Staniszewska led the publication of GRIPP2 guidelines for reporting public involvement in research (see page 6).

In January 2018, CLAHRC WM held a workshop to look in detail at the NIHR INVOLVE Standards for PPI, highlighting examples of good practice and areas for improvement. CLAHRC WM is registered as a ‘free-styler’ and will report its progress on implementing the new standards

Partnerships / Collaborations:

Our PPI Lead, Magdalena Skrybant has helped develop the local PPI infrastructure and works closely with the PPI Lead in UHBFT, as well as with the newly-appointed PPI Leads in NIHR Centres.

CLAHRC WM is also an active member of the West Midlands regional group PILAR (Public Involvement and Lay Accountability in Research). Our PPI Lead contributed to the development of PILAR’s website, and co-designed a poster about PILAR, presented at the NIHR INVOLVE conference.

Close regional working helps facilitate sharing of

best practice, sharing of resources and developing strategies to overcome challenges to meaningful involvement of patients and the public in research.

Resources:

Each of our themes has its own budget for PPI and appoints a researcher with responsibility for supporting PPI Advisors. We also fund a PPI Lead who provides support to PPI Advisors and researchers, including delivering and facilitating training, helping ensure PPI is embedded in research projects, and that involvement is aligned to NIHR Values and Principles.

Over the previous year we have supported four PPI Supervisory Committee meetings. These meetings allow PPI Advisors and PPI Theme Liaisons to report on their experiences. A PPI report is presented at our Steering and Executive Committees, and the Supervisory Committee elects representatives onto our Steering and Executive Committees (two members to each Committee). Our Director has a slot at the PPI Supervisory Committee meetings and listens and responds to feedback from the Advisors.

Examples of Impact:

We anticipate that GRIPP2, will enable researchers to be more consistent in the way they report PPI and we hope our PPI Advisor study will aid our understanding of the development of PPI Advisors within their roles.

Each Advisor makes a unique and valuable contribution to research. *“PPI input has ensured we stay patient-focussed and keep patient experience at the heart of the project.”* (Dr Gill Combes, researcher). *“We challenge [researchers] ideas, in a nice way, and help them think things through. By involving patients and the public, researchers get a completely new or a different perspective.”* (Richard Grant, PPI Advisor).

Communicating awareness:

A range of methods are used, including: our news blog, social media platforms, and using NIHR dissemination mechanisms, such as BITES. We work in partnership with our PPI Advisors to ensure that communications are accessible. Opportunities to participate, be involved in, and engage with research are shared with local and national networks and this year we have used opportunities to share research with groups that are often under-represented. We have developed links with the Institute for Superdiversity at the University of Birmingham, which co-produces research with migrant communities, and has won an award from Wellcome Trust to engage pregnant/post-natal women with research.

The financial climate within health and social care continues to be extremely challenging at present. As part of reviewing our current work programmes and as part of preparing to submit a future bid for NIHR applied health research infrastructure, CLAHRC WM has held 34 additional engagement meetings with senior NHS and Local Authority representatives. This has been in addition to our regular meetings and forums where we engage with these groups. We have been cheered by the enthusiasm and appetite to undertake new projects and for the CLAHRC approach despite the financial climate. The 2017/18 quantum of £4.89 million matched funding represents an increase of over £200k on the previous financial year and means that we are now projected to deliver over £22.6 million of matched funding against the original award of £10 million. Matched funding remains fundamental to CLAHRC WM and it is difficult to think of any project within our wide portfolio that could be delivered without the matched funding provided from our local NHS.

Our traditional engagement with matched funders has been through ad hoc meetings and events, and our annual Matched Funders Forum that usually accompanies our Scientific Advisory Group. However, the increasing pace of change and integration has led us to re-evaluate this approach and we have now decided to focus our matched funding engagement through the three Membership Innovation Councils set up by the WM-AHSN. These groups meet quarterly and each cover two STP areas, and include representatives from all of the NHS and Local Authority providers within that area, alongside other key stakeholders and industry representatives. This has allowed us to engage more broadly, including with organisations with which we previously had no relationship, and to take a more integrated approach to future research collaborations, as well as bringing closer links to the WM-AHSN and STP agendas. Therefore we can maintain our levels of matched funding despite a challenging financial backdrop and lays a foundation for future collaborative, STP-focused projects.

As our matched funding partners have been drawn deeper in to the planning for STPs, it became clear through our conversations there were significant gaps in knowledge and evidence around some of the service changes and reconfiguration of care proposed. In order to explore these and to set research objectives we hosted a Health and Social Care Summit entitled '*Re-Imagining Integration*' in June 2017. This involved the leaders of Coventry City Council and Warwickshire County Council, council officials, national subject experts, and representatives from the NHS, third sector organisations, academia, the public and patients. Many participants commented that it was unique that all of these groups had been gathered in this way and as a result of discussions several new work programmes are planned or

underway for the remainder of CLAHRC WM with a focus on these issues.

As part of our review of internal work programmes, we held two 'Dragon's Den' workshops in January and February 2018. During these events our research academics were challenged to 'pitch' research proposals to a panel of NHS executives and PPI representatives. These events proved popular with both presenters and panel members and have helped generate a number of ideas for new research areas and refinements to proposed work streams.

The environment of innovation and research that we have contributed to led University Hospitals Coventry and Warwickshire Trust (UHCW) to open an 'Innovation Hub' this year. UHCW has collaborated with us on a wide range of projects and currently has one of our embedded researcher posts from Warwick Business School within the Trust. They have held a Medici innovation evening which was attended by members of CLAHRC WM, and also hosted a TED-style Thought Leadership Day at which the CLAHRC WM Director delivered the key note presentation on the use and misuse of hospital data. We anticipate that as a result of this day and presentation they will be the first hospital in the region to implement revised board papers with increased use of Statistical Process Control (SPC) charts, which was featured as one of our Added Value Examples in our annual report for 2016/17. We also hosted a visit from the Head of Data Analytics at NHS England in June 2017 to discuss our work on this topic with a view to increasing national collaboration, uptake and implementation.

During 2017 our Head of Programmes (engagement) was invited to join a new monthly group convened under the Regional Medical Director of NHS England titled '*Operational Service Improvement meeting of Arms Length Bodies*'. This group includes representatives from NHS England, Clinical Networks, Public Health England (PHE), Health Education England (HEE) and the WM-AHSN with the aim of increasing coordination and collaboration between these organisations. It has already highlighted new opportunities and shared interests and as a result led to our staff presenting at a PHE's 'Public Health Research and Practice' workshop in November 2017, and HEE being represented in our Dragons Den event in February 2018 (see above).

Training Overview:

As we enter the latter phases of CLAHRC WM we have capitalised on our existing strengths regarding training and enhanced our collaborative working with the WM-AHSN to offer a varied and substantial package of training opportunities.

Development of staff:

Our staff have benefited from new training developments that we are involved in. Following the success of our collaboration with the WM-AHSN and West Midlands Patient Safety Collaborative to deliver training at a greater scale, we have developed a reciprocal arrangement allowing affiliated staff to attend workshops and training events offered by one of the collaborators. This has been very effective in enabling the dissemination of good practice. A recent example is the Learning from Excellence programme (see page 36), which utilised Appreciative Inquiry techniques. Over 180 health professionals in the West Midlands have now been trained in this skill and provided with tools to allow them to reflect on their practice and sustain change.

Our Leadership and Diffusion Fellows provide individual points of contact for staff. These individuals are accessible, being spread throughout our member organisations, and their interest in research and involvement with our projects allows them to diffuse ideas and best practice.

We have a strong connection with Warwick Business School (WBS), which has enhanced our access to training, as well as enabled participation in the development of materials. A Massive Open Online Course on healthcare leadership and innovation was launched in May 2017, with 4,500 individuals signing up globally. We were instrumental in developing the platform, including providing material for case studies to demonstrate how our work has changed practice. Our successes have thus been communicated to an audience well outside our local boundaries, helping in the development of staff in a wide variety of settings, as well as those within our own infrastructure.

We have actively publicised cross-CLAHRC events and supported and encouraged staff and PPI Advisors to attend, viewing these as excellent opportunities for development and networking.

Our lead in WBS has been instrumental in the development of an MBA focused on health care. Through this both clinicians and management staff can access innovative methods for delivering high-quality care to an ageing population within the context of current austerity. Translational work we have conducted has been inspirational in establishing the course, providing practical case studies and solutions to staff across the health care sector. Work is also underway to develop a distance-learning MSc to

increase access for staff, which is expected to launch in early 2019.

Training opportunities have also been provided for our staff and students in the areas of public health, modelling, statistics, over-diagnosis, evidence synthesis, and medical imaging. Staff have also been encouraged to attend project-specific training opportunities.

Our PPI Lead continues to deliver training to involve patients and the public in research in a meaningful way. These have included the Clinical Academic Internship Programme; induction for PhD students; a session for early career researchers on involvement in research; and sessions on postgraduate modules. Signposting to resources, particularly those produced by NIHR INVOLVE, are always included, as well as case-studies of PPI in CLAHRC WM, which helps contextualise learning. Further, the PPI Lead co-delivered a teaching session with a PPI Advisor, allowing attendees to benefit from their personal insights into experiences of public involvement and its value to research.

From March 2018, our PPI Lead, together with other PPI Leads and RDS Frontline Advisors in the Trust, will be available at monthly drop-in sessions where staff can obtain advice and feedback about involving the public in their research projects.

We also facilitate a Research Midwives Forum across the West Midlands, which meets twice a year to share ideas, discuss new trials, challenges with current trials, and the results of published trials. The Forum has met eight times and is well-attended by midwives from all the research-active Trusts across the West Midlands, as well as staff from the local CRN. The forum is consistently evaluated positively by those attending.

We have funded four external staff to undertake evaluation training that they can apply back in their workplace environments. This includes two staff from the West Midlands Genomic Medicine Centre and two staff from the Service Improvement team of a local acute hospital. We aim to deliver a range of training and development across the NHS, PPI advisors, and early career researchers to further build capacity across our region.

Particular strengths of the training environment:

We offer expertise, not just within our particular research areas, but in the skills and organisational understanding that underpin the operation of research within a dynamic and pressurised clinical environment. Staff and students affiliated to one of the substantive themes are able to access topical seminars relevant to their specialist field, yet can also gain a broader understanding of how organisations work and function, and how research methodologies shape and influence

how data are interpreted. For example, current work on patient falls within hospitals is enabling nurses to review and implement an intervention to try and reduce these events, something that would not be possible or practical without academic support. More widely, the work on absorptive capacity within organisations provides a framework for understanding how new practices are adopted and implemented. This mix of the local and specific with the broad and general provides an environment where individuals can access expertise at a level to suit their requirements.

Our training environment also offers flexibility in terms of different types of engagement. For example there are single, focussed events, alongside training courses of longer duration.

Our team is also involved in providing training, drawing on the examples and experiences gathered over the previous years. Notably this has included lectures for the MSc in Healthcare Policy and Management, and for the Masters in Public Health at the University of Birmingham, as well as a module on Health Screening at the University of Warwick. We also made a joint presentation with the WM-AHSN on our collaborative working and projects to a group of international PhD students.

Embedded posts are a particular strength of our training environment and continue to be a success, with three posts at UHBFT and Heart of England Foundation Trust, a GP post at University Hospitals Coventry and Warwickshire, one at Sandwell and West Birmingham hospitals, and three based at Keele University.

We have a particular focus on the academic development of midwives. Prof Sara Kenyon, who leads the maternity section of our **Child and Maternal Health theme (1)** and who is an NIHR training advocate for midwifery, has supervised four NIHR midwifery interns, and five dissertations for the NIHR Masters in Health Research. Topics have related to work being undertaken by the theme and thus have the added bonus of involving the midwives in the broader work being undertaken.

Ensuring that research student / support staff receive a high quality development experience:

The work of the last few years is now bearing fruit with 35 students completing their postgraduate studies (33 PhDs and two Masters awards), some of whom have gone on to post-doctoral work within CLAHRC WM, demonstrating not only that our students have had a positive experience during their studies, but also that we are able to enhance capacity by retaining expertise. A further four PhD students have started in the last year.

All students are able to join the seminar and speaker programmes related to their own groups and have

the opportunity to present and discuss their work. Our Programme Steering Committee also routinely includes a presentation by a student or researcher, allowing them access to an audience with a high level of expertise, while remaining within a supportive environment.

PhD and Masters students also complete a rigorous set of modules and training in their first year to equip them for the later stages of their research.

This year one of our trainees successfully obtained a NIHR Short Placement Award for Research Collaboration (SPARC), while we also hosted a SPARC trainee from another CLAHRC. Two of our trainees have been successful in applying to the NIHR Summer Training Camp.

Early career researchers are also well-supported. WBS offers membership of its long-established Organising Healthcare Research Network, which enables students and early career researchers to present research and to apply for support to attend conferences. WBS also runs a Distinguished Lecture Series, where international researchers provide seminars and one-to-one discussions tailored to individual need.

There is a strong focus on ensuring that researchers without prior experience of working with patients/public have the opportunity to present early research ideas to CLAHRC WM's PPI Advisors and to gain feedback on developing public involvement. It is a welcoming and supportive environment, and our Advisors and PPI Lead provide constructive feedback to researchers, including practical suggestions on how to contact patients and work in partnership with them to develop and implement PPI strategies with success.

Links with NIHR:

We have continued to broaden and deepen our involvement with the regional NIHR infrastructure. We are based within the Institute for Translational Medicine at UHBFT, and the medical school at University of Warwick, meaning we are co-located with key infrastructure and innovations, such as the West Midlands Genomics Medicine Centre, the Centre for Rare Disease, Midtech, and WM-AHSN.

We have assisted with successful bids for the BRC and Trauma MIC and have provided support to NIHR infrastructure to develop better PPIE structures and processes. Further we have assisted with recruiting new PPI Advisors and offering training, most notably through the Public Involvement and Lay Accountability in Research (PILAR) group, which has helped build capacity.

We have agreed to jointly fund a health economist post in conjunction with the Trauma MIC, offering methodological expertise to the MIC that it might otherwise have struggled to access, and providing us with new industry collaboration opportunities.

We have also contributed to national NIHR collaboration. Having led a programme agreed by the CLAHRC national directors, we convened a round table discussion hosted by the Medical Research Council in January 2017 on the “Health Economics of Service Delivery”, publishing a summary article and framework for future work.

We have also led another piece of national work with the backing of the CLAHRC national directors, looking at the uptake of actionable findings generated by the NIHR Health Technology Assessment (HTA) programme, working in collaboration with the NIHR National Evaluation, Trials and Studies Coordinating Centre. The study has reviewed over 350 research papers from five full years of the HTA programme, defined where we believe there are clear, actionable findings for service delivery organisations. We are now starting a detailed piece of work to try and track the uptake of evidence using a mixture of Hospital Episode Statistics (HES) data and qualitative research. Without our detailed work undertaken in reviewing and categorising papers this project would not have been possible, nor would the follow up work on uptake be feasible as we can draw on our links with UHBFT, one of the leading organisations for the extraction and interrogation of HES data. There has already been national interest in this project from the Department of Health and Social Care and other national bodies and we believe its findings are likely to achieve national impact.

We continue to collaborate on a wide range of cross-CLAHRC projects (37 during 2017/18). Agreement was reached with CLAHRC East Midlands to jointly fund a Statistical Intelligence Analyst (from February 2018) to work with health informatics and HES data to support studies. The post is based within the Health Informatics team at UHBFT, working on both joint and independent research projects on behalf of the two CLAHRCs.

Having successfully completed an NIHR Programme Development Grant in conjunction with South-West Peninsula CLAHRC (*“Education and facilitation to improve clinical decisions and multidisciplinary team-working with older adults with multimorbidity”*), we have now submitted a stage 1 NIHR Programme Grant application under competition 26 and look forward to the outcome of the application process.

Our engagement and involvement has deepened with the WM-AHSN at both a strategic and operational level. At strategic level the Managing Director of WM-AHSN and Director of CLAHRC are members of each others’ Executive Board, whilst our Head of Programmes represents us on the WM-AHSN Mental Illness Prevention Board, and the Northern, Central and Southern Membership Innovation Councils, which ensures engagement with and relevance to the six STPs within the region. We look forward to being able to support their need for evidence as they seek to develop new integrated models of care, and developing an evidence base around best practice and implementation science through evaluation of these.

There have also been several joint meetings outside of this governance framework to look at current and future joint working and to ensure that wherever possible our strategic aims are in alignment. At the operational level we are undertaking a number of significant studies in collaboration with the WM-AHSN, including the Learning from Excellence (LfE) programme (page 36), the Safer Provision And Care Excellence (SPACE) programme (page 26), and the development and evaluation of a Medically Unexplained Symptoms (MUS) service within the region, where we are partners on an Innovate UK mental health test bed application. Our Head of Programmes acted as a selection panel member for the Health Foundation Q Fellowship regional recruitment undertaken through the WM-AHSN, and one of our PPI Advisors presented an award at the WM-AHSN ‘Celebration of Innovation’ event.

Links with Industry:

During the 2017/18 financial year we signed 18 licence agreements, and we work closely with our commercialisation partner MidTech to ensure that proper protections of intellectual property (IP) are obtained and enforced. Our IP lead attends various events and seminars to ensure we remain up to date on key developments and regulation.

Over the last 12 months we have continued to engage with and support industry and SMEs in a targeted, but effective way. Our Head of Programmes (engagement) acts as a focal point for industry engagement and liaises with key stakeholders around industry and innovation. In consultation with WM-AHSN we published our Industry Engagement Strategy in 2015/16, which has proved very helpful in defining what we can and cannot offer, as well as identifying particular areas of strength to work on. We have limited resources to devote to industry engagement and therefore our priority is to maximise the return on the resources available, rather than a blanket engagement approach. With this in mind, the WM-AHSN and their online innovation exchange, Meridian, acts as our point of contact for industry, highlighting where we can provide maximum impact, which has led to several significant funding opportunities. Often industry partners seek Health Technology Assessment appraisals of their products, which is outside our scope. In these instances we make contact with interested academics elsewhere within our partner academic institutions.

A new initiative this year has been the introduction of cross-CLAHRC industry engagement, where industry contacts are directed towards other CLAHRCs that may be better suited to assist – “if you contact one CLAHRC, you contact all CLAHRCs”. For example, Infinity Health are an SME with a digital platform that facilitates task management and information sharing within the healthcare environment. Although they initially contacted CLAHRC North West London, they were directed towards us on account of our work with the Professional Record Standards Body (see page 35). We were able to share evidence from our initial scoping review of the evidence for what elements of information make a difference to outcomes. Without this information, the product might have been of limited use to the NHS or encouraged workflows to diverge from evidence-based guidance. Further, as the product is currently being targeted at community teams in the NHS, we provided an introduction to the Innovation Manager at Birmingham Community Healthcare NHS Foundation Trust, the largest community provider Trust in the country.

Specific Progress:

We work closely with the NIHR Clinical Research Network to assist with trial development, including providing updates on projects and activities, and working to identify possible areas for collaboration.

The Chronic Diseases theme (4) continues to collaborate with the British Pharmaceutical Society, and to expand the adoption of the STarTBack model through licence agreements (see page 27).

Through our base within the ITM we continue to support work on medical technology and devices. This includes the NIHR Trauma Medtech and In vitro diagnostic Centre (MIC), launched in January 2018, for which we provide links across NIHR infrastructure and industry, and supported PPIE development. We also offer academic expertise with our Director acting as a theme lead for the MIC. We are also working to support the development of the Medical Devices Technology Evaluation Centre (MD-TEC) based in the ITM and will be represented at a number of workshops with SMEs and industry during the summer of 2018 to explore opportunities within the centre. The MD-TEC also includes a full clinical simulation suite for the development of off line testing and human factors work, and we hope to develop new work streams and funding in this area. We also continue to work with our local SME and industry engagement partners on ad hoc requests for support and expertise.

Through the Membership Innovation Councils of the WM-AHSN we have regular contact with the Association of British Pharmaceutical Industry, as well as key representatives from Lilly, Janssen, Pfizer and Allergan. In addition, we have established new strategic relationships with the Nuffield Trust (in collaboration with CLAHRC North Thames) and the PSRB.

The work with the Nuffield Trust will study emerging evidence on strategic management from a selection of STP areas using a mixed-methods approach. The idea is to analyse and provide rapid feedback through workshops on what is working and not working as the STPs emerge and mature, which ought to provide research insights, as well as practical implementation advice for senior NHS leaders. The work programme with the PSRB will involve a review of the quality of hospital discharge documentation over time and look at whether PSRB standards for discharge have been effectively implemented or not, and if so, whether this has made a difference to the quality of discharge documentation.

We also continues to work on two evaluations funded by the WM-PSC: the Safer Provision And Care Excellence (SPACE) programme (page 26); and the Learning from Excellence (LfE) programme (page 36).

Theme 1: Maternity and Child Health

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