NIHR CLAHRC
South West Peninsula

NHS
National Institute for
Health Research

NIHR Collaboration for Leadership in Applied Health Research and Care South West Peninsula (PenCLAHRC)

Annual Report for period 1st April 2016 – 31st March 2017

1. OVERVIEW OF ACTIVITIES

The overriding aim of CLAHRCs is to promote the generation and use of patient-focussed research evidence to benefit the health of the population. PenCLAHRC has three major objectives:

- To substantially increase the volume and quality of patient-focussed research
- To facilitate the use of research evidence to inform service delivery to improve health of the population
- To build capacity within the health economy to generate and use research evidence.

In addition, we aim to promote the growth agenda and to influence the culture of partner NHS organisations towards the more effective use of evidence and the culture of academic partners towards a clearer focus on research impact through co-production.

In the table below we summarise progress against the short-, medium-, and long-term goals through which we aim to meet these objectives. These goals focus primarily on creating supportive systems, engaging partners, and maximising research capacity.

PenCLAHRC strategy

The development of a clear and strong partnership between decision makers – policy makers and managers within provider and commissioner organisations, clinicians of all disciplines, and members of the public – and academics underpins our activities. We hypothesise that failure to achieve effective use of research evidence in part relates to the failure to effectively address the information needs of these groups.

Representatives of all of these groups, including members of the public, are embedded within organisational structures to ensure strategic decisions are shared by stakeholders. All partner organisations (along with representatives of our public involvement group) have a seat on the Management Board and on the Stakeholder Group that prioritises research questions. The Management Board meets twice a year to advise on strategy, and the extent to which we are reflecting their priorities and capacity needs. As well as health and social care partners we have made a significant effort to engage with third sector organisations and industry, working closely with our AHSN.

We have put in place mechanisms to elicit the "uncertainties" that reflect problems facing decision makers and these are closely linked to our programmes to build capacity amongst partner organisations. Together these activities – mechanisms to capture uncertainties, and development

work to build capacity – make it possible for us to extract decision-making needs from complex clinical and policy issues and translate them into answerable questions. These are prioritised against agreed criteria with advice from stakeholders. This process may lead to reviews of evidence, primary research or the development of implementation plans with partners. Throughout we aim to keep the originators of the "uncertainty" involved in the process to ensure that our work is kept practically relevant and impactful.

Applied health research

Our core strategy remains unchanged - NIHR funding primarily underpins the human infrastructure that enables us to produce preliminary data (sometimes producing stand-alone studies) and apply for grant funding for definitive studies to address important uncertainties. Our process for identifying potential uncertainties has evolved in response to continuing evaluation and includes uncertainties in implementation and research. The process is increasingly closely aligned to our "Making Sense of Evidence" programme so that our activities in improving both the use and generation of evidence are mutually informing and reinforcing. In addition we have identified some specific topics such as multi-morbidity and care of older people with complex problems for which we have sought with partners to identify key uncertainties. Our public and patient groups remain at the heart of all activities including question selection and research and implementation design.

A number of studies begun during the pilot CLAHRC phase continue, many externally funded. These studies have led to many papers in high impact journals. The existence of this legacy has important positive consequences for our relationship with partner organisations. There is often a problem in attempting to reconcile the timescales to which definitive research projects operate with the fast moving needs of the NHS which can lead to tension with partners who find it hard to see the direct relevance of the CLAHRC to their needs. Being able to present them with the results of previously developed projects allows us to demonstrate how these can impact on service provision and hence increase support for our activities.

The expansion of our portfolio of implementation science research has continued and we have made further appointments of Research Fellows. This capacity is further strengthened with the award of an NIHR Knowledge Mobilisation Research Fellowship to Dr Maguire. Some of our joint work with the AHSN involves using ethnography to evaluate our implementation of evidence-based approaches in the design of acute stroke care and the use of patient-initiated clinics in outpatient services in chronic disease. Our Person-Centred Coordinated Care (P3C) Group have worked with local NHS organisations aiming to establish integrated care to develop methods to understand and evaluate the implementation of New Models of Care spanning primary and secondary care and health and social care.

Improving health through the use of evidence (see Section 5)

We work with NHS partners, private sector providers, the AHSN and Strategic Clinical Networks to increase the effectiveness of services through better use of evidence, building on 2 fundamental principles:

- Incorporation of "implementability" throughout the research process including question selection, intervention design, choice of outcome measures, research conduct, and research dissemination. Synthesis of evidence is guided by those who will use it. By taking an integrated approach to knowledge mobilisation and involving end users at all stages we focus our efforts on interventions that are not only effective but feasible and acceptable to organisations, clinicians, and patients.
- Context is crucial and potential projects are approached by building an appropriate team on the topic area including end users of information, academics, and managers. Design of service improvement strategies is preceded by diagnostic evaluation of potential barriers and facilitators at the levels of system, organisation, team, and individual.

Capacity building (See Section 7)

Our drive to increase the capacity of staff within the local health economy to use and generate evidence has four main strands:

- ***PhD studentships***

15 PhD studentships are directly supported by the CLAHRC (including four studentships from the Research Capacity in Dementia Care Programme). CLAHRC staff also supervise students funded by other means.

- ***Explicit training***

We deliver training in evidence-based practice, research methods, and operational research in multiple formats including short courses aimed at all disciplines, bespoke training for teams or disciplinary groups, and training for members of the public. Relationships developed during these sessions have been instrumental in implementation of evidence and generation of research projects.

- ***Health Service Modelling Associates***

Our training programme in Operational Research (OR) included 6 one-year part-time secondments of NHS staff in 2016/17 to work on modelling projects agreed by their organisations. These provide training in OR skills and answer immediate substantive organisational challenges. A further set will begin this year.

- ***Joint projects***

Conducting joint projects in partnership with NHS staff addressing uncertainties of direct relevance to their practice is a powerful way of enabling them to develop their research and implementation skills and of ensuring that academics understand the needs of the service. A large number of PenCLAHRC projects include NHS staff as partners; others work with individuals and groups from other public and third sector organisations.

Wealth creation

We work directly and with the AHSN to build links with industry and third sector organisations where we can provide the research skills to appropriately evaluate innovative interventions and to ensure that innovations created within the NHS can be exploited. Our major contribution is through the design and evaluation of more effective and efficient services and public health interventions, freeing resources and contributing to improved population health in ways that have knock on effects for productivity.

Key achievements in the period

- **Facilitating the delivery of improved services (see Section 8)**

PenCLAHRC has worked with partners, building on a strong relationship with the AHSN, to use evidence to improve service delivery and patient outcome and key examples are discussed in section 8. Fundamental to these successes has been the development of relationships between academics and those delivering services and the skills that enable academics to work effectively in the world of service delivery.

- **Expansion and consolidation of the capacity development programme (see Section 7)**

Our capacity building programmes have expanded and been reorganised with the development of new programmes such as the HSMAs, strengthening of generic training for PhD students and establishment of “communities of practice” amongst students with congruent topics.

- **Attracting external grant funding**

Using our core NIHR funding to attract external grants to undertake definitive research remains central to our strategy and has resulted in the award of £19.2M in external grants since January 2014.

Summary progress against short and medium term aims

Short Term Aims	
Aim 1	Maximise research output/impact from current PenCLAHRC Projects
Progress	*£5.9m in external funding and 79 published papers in the reporting period. 2 Impact Case Studies (TXA & Stroke) featuring in the National CLAHRC Impact Document.*
Aim 2	Work with SW AHSN on topic identification and implementation
Progress	*AHSN & PenCLAHRC staff contribute to both prioritisation systems. 7 jointly funded projects, primarily aimed at service improvement since 2015.*
Aim 3	Identify next generation of prioritised topics for research and implementation
Progress	*Stakeholder Prioritisation Round 3 held on 17/3/17. Generated 55 "uncertainties" from Stakeholders. Questions not addressed by PenCLAHRC forwarded to NIHR-RDS and NETSCC.*
Aim 4&5	Effective links with NHS, local authorities, public health and social care
Progress	*Our Management Board and Project Prioritisation system include representatives from public health and all partner NHS Organisations. Joint projects with NHS, local authority (STARS and HeLP), the Police (ExPERT), social care providers (Integrated Care Evaluation and Care home interventions (CHIK-P)) and charities (Family Vision, DeIrDre).*
Medium Term Aims	
Aim 1&2&3	Engage NHS organisations, clinicians and the public in identifying key information needs & translating this information into clear research questions prioritised against clear criteria.
Progress	*32 Making Sense of Evidence (MSE) workshops conducted for 659 NHS/LA/Police staff, academics, patients and members of the public during reporting period. 142 elicited "uncertainties" considered in 3 rounds of Prioritisation Process, (8 prioritised).*
Aim 4,5&6	Knowledge Mobilisation and translation of evidence into improved services
Progress	*Multiple examples of service improvement e.g. redesigned pathway for Bladder Cancer diagnosis leading to a substantial decrease in patient referral to treatment time; development of Risk Assessment Tools (RATs) to aid diagnosis for bowel cancer, implemented within GP surgeries across the region/country (see Added Value examples).*
Aim 7	Research into effective methods for translation of research evidence into service provision
Progress	*Expansion of implementation research team, led by NIHR Knowledge Mobilisation Fellow (Lang). Includes a further 2 implementation science researchers and another recently awarded NIHR Knowledge Mobilisation Fellow (Maguire). Current projects include ASPIC (AHSN funded), CHARLIE (review of implementation approaches in care homes – CHIK-P), DeIrDre (Alzheimers Society-supported), and evaluation of effects of the PROFHER trial).*
Aim 8	With partners, build capacity of staff to use and generate evidence
Progress (Section 7)	*Includes 15 funded PhDs (4 within the NIHR RCDCP), 6 HSMAs (6 further planned for 17/18), 2 SWARM Fellows. Multiple training opportunities for partners in Making Sense of Evidence, Operational Research (OR), PPI, Qualitative Research Methods and Statistics*.
Long Term Aims	
Aim 1	To produce a step change in the generation of patient-focused research
Progress	*Since the start of the current funding round PenCLAHRC has attracted £19.2 million in external research funding and published 208 papers. The studies were generated in association with members of the public through our 3 lay groups, 3rd sector organisations, clinicians and NHS organisations.*
Aim 2	To improve health outcomes for patients and the public through effective use of evidence
Progress	*Multiple examples of evidence-based impact on services and health including the re-design of acute stroke services increasing appropriate thrombolysis, tools for cancer diagnosis*

	included in NICE guidance, reductions in waiting times for mental health outpatients through use of OR, and routine use of tranexamic acid in trauma by paramedics and ED staff.
Aim 3	To increase the capacity of staff to use and generate research evidence
Progress	*See medium term aim 8.*
Aim 4	To help change the culture of organisations in the health service so that explicit use of research evidence in policy making and practice becomes "normal business"
Progress	*Success has been patchy, perhaps related to the scale of the CLAHRC cf the partners and NHS turmoil. Successful exemplars in some clinical areas (e.g. stroke care) and some organisations (e.g. South West Ambulance Trust) provide cause for optimism. Work with the AHSN in key areas including development and evaluation of New Models of Care is promising.*

2. PROGRESS MADE IN EACH RESEARCH THEME

In each of our themes we aim to deliver against our objectives of increasing the production of high-quality research, facilitating better use of evidence to improve health and health services, increasing capacity to use and generate evidence, and contributing to the growth agenda. PenCLAHRC strategy is built around the hypothesis that working with decision makers – members of the public, clinicians, and policy makers – to answer their information needs through use of new or existing evidence increases the likelihood of achieving health gain. This frequently requires working across themes and we actively encourage this. The sections below highlight progress against the aims set out in our bid alongside some noteworthy achievements in each theme. However, it is important to note that the space available only allows us to present exemplars and many activities, particularly relating to implementation and capacity building, are discussed in other sections. The sections below are organised by key CLAHRC objectives but projects frequently address more than one objective (e.g. Research and Improving Health and Wealth or Research and Capacity building).

Person Centred Care (led by Professors Britten and Byng)

Research

Highlights include substantial progress in developing existing projects and a number of new projects (*major grants in italics*):

- A novel person centred approach to care using individualised bio-psycho-social 'shared understanding and plan' has been developed in the **Engager** (prison leavers, *NIHR PGfAH*, now being implemented by Midlands Mental health Commission) and **Partners 2** (psychosis in primary care, *NIHR PGfAH,* successfully piloted)
- REACH-HF (Rehabilitation Enablement in Chronic Heart Failure): This *NIHR Programme Grant*, to develop and test an individualised rehabilitation programme which includes user friendly manuals for both patients with heart failure and their caregivers, and is facilitated by specially trained nurses, has completed recruitment to the main trial. The results will be available towards the end of this year.
- **ReTRAIN**, a patient-initiated pilot trial of a novel intervention for post-stroke rehabilitation funded by the *Stroke Association* is now complete and results submitted for publication. A funding application for a full trial is being prepared.
- Disabled children are admitted to hospital disproportionately frequently and members of the PenCRU Family faculty designed the **Hospital Comms** project to improve the ability of hospital staff to communicate effectively with their children. The training has been converted into a manual to enable evaluation in a multi-site study.

- The **Person Centred Coordinated Care (P3C)** programme addresses individuals with long term conditions needing care from multiple teams (see Added Value Example – P3C and also Improving Health and Wealth below). In collaboration with the AHSN, we have engaged with local systems, and developed theory, innovation, and a consistent evaluation framework for P3C -contributing to making New Models of Care more evidence informed. Two measures have been developed: one to assess patients' experiences of person-centred and coordinated care (translated into 5 different languages, and now being used around the world), and one an implementation and reporting tool to measure and support organisational change. Commissioning guidance has also been developed and will be launched imminently.
- In collaboration with CLAHRC YH, we have received over £2 million (*HTA Programme*) to examine the effectiveness and cost effectiveness of a home exercise programme for frail older people discharged home from hospital following acute illness or injury (**HERO**).

Improving Health and Wealth

Highlights include:

- Reconfiguration of services aiming to provide **Person-Centred Coordinated Care (P3C)** is seen as key to increasing the efficiency of the NHS. In collaboration with the AHSN we are completing project work with five local service providers across four health systems (Yeovil (Symphony), Taunton, Exeter, and Torbay) to evaluate a range of community and primary-care-based projects, adapting the evaluations to the needs of each service.
- In partnership with the *AHSN*, **Patient Initiated Clinics** were effectively implemented in Rheumatology in one centre, have been extended to other specialities, and are actively being considered by other Trusts across the country. A "PIC Implementation Tool" has been developed to aid implementation.
- Based on a review of evidence on effectiveness of interventions to reduce unnecessary admissions in children, PenCLAHRC staff worked with clinicians through the SCN to examine the effects of instituting a series of service changes. These changes were associated with a 17% reduction in admissions in one trust and by 11% in another (**Paediatric Acute Admissions**).
- There is concern that published research may fail to affect practice. We have used routine data to examine the effect of the NIHR-funded Profher Trial (which demonstrated equivalence between surgical and conservative management of fractured upper humerus) on practice. . This demonstrated a substantial fall in operative management, with the decline being more rapid in units which participated in the trial.
- Pain relief is essential in the management of hip fracture and delays in achieving relief can slow progress through ED. We are working with South Western Ambulance Service NHS Foundation Trust, orthopaedic surgeons, and anaesthetists to explore the possibility of Paramedic-Administered **FIC Blocks** for Hip Fracture**.**
- **Care Homes**: We are working closely with a range of long-term residential care providers (care homes and nursing homes) across the South West to improve the care they provide while at the same time improving our understanding of how the sector can improve. Two central pieces of work, our collaborative systematic review of how to implement evidence-based practice in care homes and our qualitative study of how care-home managers achieve success, are almost complete.

Capacity Building

- Two CLAHRC-funded PhD students within this theme.
- We continue to offer support and training to researchers and clinicians, as well as to our PPI representatives, to support best practice. Our PPI Advice Clinics remain popular with colleagues seeking advice on specific projects.

Mental Health and Dementia (led by Professor Dickens and Dr Town)

Research

Highlights include (*major grants in italics*):

- In the **MBCT for young people with emotional disorders and their carers** project, we have worked collaboratively with colleagues from the AccEPT Clinic at University of Exeter, Virgin Care Devon, King's College London, South London and Maudsley Trust, and the Mindfulness in Schools Project to produce a joint programme manual, as well as to pilot eight therapy groups (four with young people and four with carers). The aim is to seek external funding in late 2017 to evaluate effectiveness.
- **Catch-US** (*NIHR HS&DR funded*) is a study of the transition from child to adult services for young people with ADHD. Early results from the first phase of the study show dramatic variation in service provision across England.
- **ShareD** is an *NIHR RfPB -funded* study led by Prof McCabe which seeks to explore how people with dementia and their carers are involved in decisions when they receive a diagnosis of dementia.
- **Decode** is a clinical decision support system designed by Dr Llewellyn which aims to improve the effectiveness of primary care referrals for memory assessment. The designers are working with the local memory clinics and PenCLAHRC modellers to examine potential effects of its implementation on referral pathways.
- Dr Savage is developing an app-based intervention based on previous work suggesting that word training can benefit people with Semantic Dementia. An application to fund formal evaluation is in progress (**WordApp**).
- Prof Owens is leading an *MRC-funded* **Suicide Prevention** study to examine a public health intervention designed to help members of the public recognise and respond to possible suicidal intent in a public setting. This is based on previous CLAHRC supported work which has demonstrated significant impact.
- An *NIHR-HTA*-funded linked evidence synthesis of the **Mental Health of Children and Young People with Long-Term Conditions** examining the effectiveness of mental health interventions for these children is complete and will shortly be published.
- **MYRIAD** is a seven-year project, funded by a *Wellcome Trust Strategic Award*, in which we will collaborate with Oxford University to look at whether and how mindfulness training can be used to prevent depression and build resilience during early adolescence.

Improving Health and Wealth

Highlights include:

- Following collaboration with Oxford CLAHRC (Walker) and a review of evidence, we are supporting the implementation of an **Integrated Psychological Medicine Service (IPMS)** across the Royal Devon and Exeter Hospital. This service aims to provide 1) routine and standardised psychological assessments to patients attending the acute hospital, 2) a workforce trained in responding appropriately to psychological distress, assessing associated risk issues and case managing patients and 3) availability of suitable psychological / drug treatments for mental disorders, delivered using a stepped-care model.
- The **Action to Prevent Suicide** programme of research has addressed antecedents and circumstances of suicide. We produced a simple public education leaflet, 'It's safe to talk about suicide', used as a basis for training frontline staff in local authorities, and emergency services, also adopted by London Borough of Haringey and by the Fire Officers' Association as part of its Blue Light MH project (with Mind). Formal evaluation identified substantial unfilled demand and we have received funding to enable information to be accessed electronically and ensure wider availability.

- Opportunities for implementation activities have arisen from 2 of our current mental health research projects (**STARS** – supporting teachers in schools; **CarED** – service users' experiences of eating disorders). They have led to testing the feasibility of teacher training to deal with disruptive children with behaviour problems (**STEER**- *ESRC funded* based on **STARS** findings); evaluating the acceptability of eating disorders services (**CarED**).
- **DeIrDRe**: Dissemination and implementation of evidence-based practices in dementia care: a systematic review, funded by *Alzheimer's Society*. In this project we worked with a charity to produce a scoping review of the evidence on this topic and conducted a systematic review of the effectiveness of dissemination and implementation practices in dementia care and the factors that may help or hinder their success.

Capacity Building

- Two CLAHRC-funded PhDs and four RCDCP-funded PhDs focused on care for people with dementia:
- The students continue to work together in a community of practice to develop and evaluate interventions that address questions prioritised in dementia care by the James Lind Alliance (See RCDCP report).

Healthy People, Healthy Environments (led by Professor Abraham)

Research

Highlights include (*major grants in italics*):

- **HeLP**: The HEalthy Lifestyles Programme is a novel school-based obesity prevention programme. The evaluation of the *NIHR-PHR*-funded cluster RCT involving 32 schools and 1324 children is now complete with various publications about to be submitted. The study received additional PHR funding in the latter stages due to the impressive 94% follow up at 24 months – largely due to the effective participant involvement in the initial intervention and study design.
- **STARS**, Supporting Teachers And childRen in Schools (*NIHR-PHR funded*) is testing an intervention to reduce child behaviour problems in a large cluster RCT. Data collection is complete and analysis underway
- **ComPoD**: The Commmunity-based Prevention of Diabetes study is a randomised, waiting-list-controlled trial funded by the *NIHR-SPHR* Public Health Practice Evaluation Scheme assessing a community-based programme delivered by voluntary sector for adults with "pre-diabetes".
- **MAGI**: Linked to ComPod, the Mechanisms of Action in Group Interventions study is funded by the *NIHR/MRC EME* Programme to develop a better understanding of the mechanisms of change in group-based interventions.
- In collaboration with Manchester University, we have received funding to lead a trial (*NIHR PHR*) to assess whether additional support via Health Trainers is effective in improving the health behaviours and wellbeing of people receiving community supervision (**Strengthen**).
- **E-coachER**: (*NIHR-HTA*) is an RCT evaluating web-based coaching added on to an Exercise Referral Scheme to increase uptake of physical activity and sustained health by patients with obesity, type 2 diabetes or pre-diabetes, hypertension, osteoarthritis, or a history of depression. We have completed recruitment with over 450 participants randomised to receive, on top of usual referral to an exercise scheme, either the e-coachER intervention or no access to the web-based support.
- We completed an evidence synthesis review (*NIHR RfPB*) to determine the factors that influence older adults' engagement in physical activity (**OPPA**). Protocol published here and final results submitted for publication.

- In collaboration with the University of York, we are conducting an evaluation (*NIHR PHR*) of the Incredible Years Infant and Toddler Programme; a newly-developed programme that aims to improve the social and emotional wellbeing of children under two and their parents (**E-SEE**).

Improving Health and Wealth

Highlights include:

- Based on interim findings from the **STARS** project, we were awarded an *ESRC Impact Acceleration Award* to test the feasibility of running Teacher Classroom Management training with teaching assistants working with children whose behaviour was so disruptive it was affecting learning.
- We are working with public health experts, schools and local charities to support children exposed to domestic violence through a parent leadership coaching programme **(Family Vision**).
- **C2: Connecting Communities** is an experiential learning programme and delivery framework to create the conditions for resident-led service provider partnerships in very low-income communities and during the reporting year, has been established as C2 National Network of Connected Communities Charity. The C2 learning programme has been delivered to Public Health registrars, housing associations, and newly commissioned sites and has been commissioned to deliver C2 to Devon and Cornwall Police to support the piloting of a new role within the police force; Police Community Management Officers.
- A *Drinkaware-funded* project examining the effectiveness of employing "club-hosts" in local nightclubs to identify and look after vulnerable customers.
- **Changing bars**: A project funded by the *NIHR-SPHR* to evaluate the feasibility of how changes in a bar environment affect alcohol sales and consumer behaviour is complete and publications being prepared.
- International collaboration as part of the SNAPP (Science for Nature And People Partnership), a working group for evidence-based conservation, has produced an evidence map on linkages between conservation activities and health. (Featured in Nature News and Comment http://www.nature.com/news/sustainability-map-the-evidence-1.18962)

Capacity Building

- Two CLAHRC-funded PhDs:
  - *Functional image training as a personalised intervention for weight loss.*
  - *Mealtime interventions in care homes.*

Diagnostics and Stratified Medicine (led by Professor Hyde)

Research

Highlights include (*major grants in italics*):

- Research on Inter-arm Blood Pressure difference (IAD) has demonstrated its major importance as a prognostic factor leading to inclusion in European Guidelines on BP measurement and a feature in the BMJ. (*NIHR-RfPB).* Further funding has been received (*NIHR RfPB*) to explore, through IPD meta-analysis,the risks associated with IAD (**Interpress**).
- We are participating in the **TriMaster trial**, which is part of the *MRC Stratified Medicine* programme led by Prof Hattersley. This will help individual patients with type 2 diabetes identify which third-line treatments are most suitable for them. The co-created patient-facing materials generated by this project have been chosen as examples of best practice for the HRA website.

- We have published our evaluation of the **UNITED** programme of systematically identifying and changing treatment of patients with monogenic diabetes (*DH-Wellcome*). We also continue to support research on improving clinical decision tools helping accurate diagnosis of **MODY**, type 1 and type 2 diabetes to underpin personalisation of diabetes care.
- Improving the diagnosis of dementia is a major component of this theme. We assist the Cochrane Dementia and Cognitive Improvement Group in up-dating their programme of test accuracy systematic reviews, particularly PET scanning and are conducting a systematic overview of brief cognitive assessment tools in primary care.
- We are supporting Prof Hamilton's highly influential work on improving **Cancer Diagnosis** in primary care *(DH - DiSCO)*. This includes evaluating the impact of NICE guidelines on diagnosing cancer *(NIHR – RfPB*) and a systematic review and economic modelling of risk assessment tools in general practice *(NIHR)*.
- We support the development of personalised care in Inflammatory Bowel Disease (IBD) in work led by Dr Ahmed. This includes the identification of genetic profiles of those at high risk of side-effects associated with drugs commonly used to treat IBD, use of new tests in primary care (faecal calprotectin) to help differentiate irritable bowel syndrome from IBD and evaluating the introduction of tests to monitor the dose of TNF alpha inhibitors.
- We are working with PenTAG *(DH TARS contract)* to provide a health technology assessment to inform the National Screening Committee on whether to introduce screening for lung cancer. This includes support for PPI (PenPIG)
- Working with Prof Fortnum (Univ of Nottingham *(NIHR)*), we have completed a major programme of research on the effectiveness and cost-effectiveness of screening for hearing loss at school entry (**Hearing Screening**)

Improving Health and Wealth

Highlights include:

- The Early Diagnosis in Cancer Group (Prof Hamilton) has produced evidence to underpin tools to inform GP decision-making (see NICE Guidance).
- **UNTEST** investigated the rise in ordering of routine tests, using thyroid function as an exemplar, and is the basis for attempting to develop interventions to change practice via electronic test ordering systems.
- Building on research examining the performance of **High Sensitivity Cardiac Troponin** in acute chest pain we are developing an implementation plan with the AHSN with the aim of reducing unnecessary admissions for chest pain across the South West.

Capacity Development

- We are working with an international team with Prof Bossuyt (AMC) to develop teaching on the evaluation of diagnostics. (https://www.medicaltestevaluation.org/introduction.html)
- We have two CLAHRC-funded PhDs who are already producing new research:

  - *Low dose CT to define pre-operative MI risk*

  - *Accuracy and feasibility of GP testing for dementia.*

Evidence for Policy Making (led by Professor Stein)

Staff primarily based within this theme provide major input (particularly systematic review, modelling, and implementation science expertise) to numerous projects in other themes.

Research

Highlights include (*major grants in italics*):

- Operational Research (OR) modelling to optimise the management of chronic hepatitis B (CHB) in children and young people (**HepFree**) (*NIHR PGfAR*).
- Modelling revascularisation after stroke with thrombolysis and thrombectomy – the most comprehensive analysis of trade-offs between access time and unit size in Hyper-Acute Stroke Units (HASUs) in England and Wales. The Stroke Association is funding a project with PenCLAHRC, Oxford AHSN, and University of Newcastle to explore the provision of thrombectomy. This will directly inform national commissioning by NHS(E).
- Our study, using OR modelling of the distribution of neonatal intensive care and its implications (**NeoNet**) and steered by the National Clinical Reference group for neonatal intensive care, is reaching conclusion (*NIHR HS&DR*).
- The CLAHRC Evidence Synthesis Team (EST) continues to drive specific systematic reviews (e.g. Cochrane Reviews on recurrent abdominal pain and patient-initiated clinics; to support reviews in other CLAHRC themes (e.g. Effectiveness of TNFa inhibitors to reduce depression in chronic physical illness); and to develop capacity and carry out methodological research (e.g. search filters to identify studies of PPI involvement and implementation science).
- The EST is currently conducting a new project which aims to develop methods to synthesise evidence of implementation and knowledge translation

Improving Health and Wealth

Highlights include:

- Attempts to "disinvest" from services shown to be ineffective have generally had limited success. We are developing a programme of work on "appropriate care" which aims to re-frame the process, effectively engaging clinicians and services.
- Modelling geographical distribution of HASUs in the south west completed last year is informing commissioning decisions through the Sustainability and Transformation Plans (STPs) for Devon, Cornwall and Somerset.
- OR modelling through our HSMA programme (see Added Value Example) has shaped STP priorities in addressing 4hr waits in A&E in North Devon and Yeovil through STP joint working.
- We have explored a mixed model for revascularisation service configuration after ST-Elevation Myocardial Infarction (STEMI) using thrombolysis and Primary Percutaneous Coronary Intervention (PPCI) and identified the access-time tipping-point that would favour a model of initial thrombolysis rather than immediate transfer to PPCI (**PenCHORD-STEMI**).
- The PenCLAHRC OR Team (PenCHORD) has carried out a programme of projects addressing configuration of services involving consideration of queueing and patient flows e.g. bladder cancer (see Added-Value Example); optimum size for Clinical Decision Units; out of hours telephone access to mental health advice; and pre-operative surgical assessment.
- The **ASPIC** ethnographic research project on implementation in two PenCLAHRC projects (Acute Stroke Pathways and Patient-Initiated Clinics) has provided important insights into scaling up innovations for our local AHSN, who commissioned the project, and more widely. The critical importance of factors at the level of the organisation and team were clear, as was the value of having high quality evidence and external facilitation.

Capacity Development

- Two CLAHRC-funded PhDs:
  - *Exploring the effects of NICE "Do not dos" on clinician behaviour*
  - *Research use and knowledge mobilisation in the third sector.*
- Systematic review training through short courses and "clinics" supporting researchers and NHS staff.

Our highly successful "Health Service Modelling Associates" (HSMA) programme has completed its first year. The first six participants, seconded part-time from local NHS organisations, worked on projects within their organisations with the support of PenCLAHRC staff. The programme is being repeated, with potential support from the SW AHSN. Expansion plans include links with CLAHRC NT (UCL) through cross-CLAHRC OR collaboration being led from PenCLAHRC and a similar programme of Health Service Implementation Associates (HSIA) is under consideration.

3. IMPACT ON HEALTHCARE PROVISION AND PUBLIC HEALTH

PenCLAHRC works closely with partners in the local health economy, especially the AHSN, with members of the public, and with third sector organisations to ensure our research is relevant to policy and practice. With partners we seek existing evidence which can inform more effective practice and use this as the basis for helping to design effective strategies for change. Although a primary focus is local services, many projects have resulted in significant impact nationally and internationally. Examples include:

1. **Improving cancer detection in primary care *(Diagnostics Theme)***

Professor Hamilton's research group, supported by PenCLAHRC, investigates methods for early detection of cancer in primary care. We have previously reported the central role of this work in informing the development of the NICE guidance "Suspected cancer: recognition and referral" (published June 2015; Guideline Development Group chaired by Prof Hamilton). The group is continuing to refine tools for use in primary care and investigating the integration of further possible indicators including haematological indices. The work has produced a range of tools to support the referral of potential cancer by primary care physicians and we are currently developing an approach to spread their implementation.

2. **Reducing time to definitive treatment for bladder cancer (*Evidence for Policy and Practice Theme)***

Delays in diagnosis and treatment of cancer cause distress and can impact outcome. A partner Trust identified an unacceptable 90 day wait for definitive treatment of patients with muscle- invasive bladder cancer. We used simulation modelling to investigate points of delay and examine potential interventions. The findings were used by the service to inform a cost-neutral pathway re-design which six months later has been shown to have led to a 25 day reduction in average waiting time for these patients.

3. **Implementing Person Centred Care for older people with multimorbidity. *(Person-centred Care Theme)***

Patients with chronic conditions, particularly those with multi-morbidity, often receive fragmented care in the NHS and social care system and there is currently a desire to develop integrated services. The Person Centred Coordinated Care (P3C) programme is a collaboration with the SWAHSN which is providing a platform for bringing research, service design and quality improvement together, alongside complex clinical and organisational innovations. A better understanding of the nature of these interventions will aid replication of the approaches to person-centred service coordination.

Key milestones in the project have been the co-development of two tools to support the implementation and evaluation of P3C: to assess (a) patients' experiences and (b) organisational change. The measures fit within a framework of measurement co-developed with commissioners in Torbay and Somerset and with patient representatives who are at the heart of the work.

The P3C work has attracted considerable national and international attention. The implementation tools are being used by partners in the SW, by University of Kent and several European-wide studies (SUSTAIN & SELFIE), and by services in the North East of England and in Australia (University of Brisbane). CLAHRC P3C researchers have successfully obtained grant funding from: NIHR HS&DR to carry out a realist review of new models of care, from NHS€ to develop a portfolio of intelligence for commissioning P3C; from Torbay Medical Research Fund for embedded researchers; and as partners in an NIHR PGfAR with the West Midlands CLAHRC to enhance support for people with long-term conditions.

4. **Improved delineation of risk in hypertension *(Diagnostics and Person-Centred Care Themes)***

Research led by Dr Chris Clark has documented the role of differences in inter-arm BP as a predictor of CVD risk. This evidence is referenced as the basis of recommendations within UK, European and US hypertension guidelines. Recent research by the group (http://bjgp.org/content/67/658/e306.long) demonstrates that the proportion of general practices in the South West reporting routine measurement of inter-arm blood pressure has risen from 8% in 2007 to 52% in 2016.

4. PATIENT AND PUBLIC INVOLVEMENT AND ENGAGEMENT

The involvement of patients and public has been central from PenCLAHRC's inception, secured by commitment in the leadership, reflected by a well-resourced team who work to implement and research involvement across the programme and amongst our partners. Patients and members of the public are involved in all aspects: recruiting and training researchers, selecting topics and designing studies, applying for research funding, helping to conduct studies, disseminating and promoting research, as members of PenCLAHRC management structures, and liaising with other involvement groups regionally and nationally.

There are currently three involvement groups that inform the work of PenCLAHRC: the Peninsula Public Involvement Group, PenPIG, the Health and Environment Public Engagement group, HEPE, and the PenCRU (Peninsula Cerebra Research Unity) Family Faculty ((http://clahrc-peninsula.nihr.ac.uk/meet-penpig). Each has an emphasis on different areas of work but share learning and some members.

Our strategy has been adjusted to account for changes in the team, but our aims remain unchanged (http://clahrc-peninsula.nihr.ac.uk/patient-and-public-involvement-in-research):

Embedding involvement across PenCLAHRC:

Our aim is that PPI is integral to all PenCLARHC activities and is as normal a part of research design as statistics. A range of experiences and conditions are held by members of our longstanding groups. We expand activities beyond these groups for individual projects, as we see direct experience as important for meaningful involvement. This includes so-called hard-to-reach groups: young people, the very elderly, people in full-time work, children with disabilities and others. We have involved people by advertising in a local paper, in GP surgeries, through the local NIHR and clinical network, public engagement activities and community groups. The PPI team runs "clinics" for staff from PenCLAHRC and partners to help them work out how best they can incorporate PPI into their projects. We have been keen to find "champions" amongst the research and clinical community, people who have worked with us and then go on to promote this way of working in their own communities. For instance, a local orthopaedic surgeon who worked with us on one grant application has become an enthusiastic and effective proselytiser across the discipline.

Developing involvement through research and theory building:

The PPI team (in collaboration with PenPIG) has generic research ethics approval for a programme of research into our activities. An abstract based on early work has been accepted at the Health Technology Assessment International Meeting in 2017 and another on the role played by ethnography in developing PPI has been accepted to the 12th Annual International Ethnography Symposium in Manchester.

Furthering collaboration with patients and members of the public:

We train members of the public to boost their confidence in their roles. For example, Dr Maguire and Family Faculty member Jane Ring co-produced and delivered joint training for researchers and public advisors consisting of activities that prompted discussions between members of the two groups, highlighting different and converging perspectives in research collaborations. In October 2016 members of PenPIG and the PPI team went on a learning exchange visit to North West CLAHRC.

Expanding the work of the involvement team:

The PPI team has local, national and international networks. Kate Boddy advises ExeCTU on PPI. Kristin Liabo delivered PPI workshops in Norway, and colleagues from Norway observed co-produced teaching with PenPIG member Nigel Reed in Exeter. Nicky Britten and Helen Burchmore are members of the Patient and Citizen Involvement in HTA Interest Group. The PPI team advised the establishment of the University of Exeter Medical School PPI steering group, and Malcolm Turner of PenPIG is a member. Dr Maguire was awarded NIHR funding to examine the role of PPI in knowledge mobilisation. Members of the Family Faculty delivered a plenary, two workshops and a poster at the 2017 European Academy of Childhood Disability meeting in Amsterdam in May. They are flooded with requests for advice on how to build PPI around research and services for disabled children and their families and have provided input for a range of research projects being led from other universities and internationally.

Public engagement:

Many members of our involvement groups have established their own networks with researchers and services in the South West, contribute to other community groups and speak about PenCLAHRC's work. This illustrates how involvement impacts on engagement when supported over a sustained period of time. In turn, some people become involved through research engagement activities. Individual study teams and the communications team of PenCLAHRC do a great deal to liaise with the wider public about applied health research. The PPI team has worked to engage senior citizens through contact with care homes and Devon Senior Voice. The team provides further networking opportunities for research-interested citizens through research training advertised to community networks.

5. TRAINING

Increasing the capacity within the local health economy to use and generate research evidence is a key objective for PenCLAHRC. This activity encompasses five broad groups of activity although these overlap and training opportunities frequently meet objectives of more than one group.

1. Trainees

We have a total of twelve doctoral trainees (eleven PhD and one MD) funded directly through PenCLAHRC of whom nine are health services researchers, one is a health economist and two are medically qualified. In addition, we have a further four PhD trainees funded through the Research Capacity Dementia Care Programme (RCDCP) – these additional studentships are for clinicians from

nursing or allied health professional backgrounds and we have two nurses, a physiotherapist and a dietician in post. Nine of the trainees have successfully upgraded from MPhil to PhD within the reporting period. A further 5 PhD students funded from other sources are supervised by PenCLAHRC staff. Since April 2016 we have had one PhD and one MRes awarded.

All of our PhD trainees benefit from the training opportunities provided by Researcher Development Programmes from both partner Universities. Those students undertaking research on dementia are part of a Community of Practice Group which meets fortnightly and provides opportunities for shared learning, with support from senior clinical academics. In addition to the routine supervision provided by PhD supervisors, trainees maintain regular contact with our Training Lead, Dr Vicki Goodwin, to ensure full use is made of training opportunities locally and nationally. Two of our trainees attended the 2016 NIHR Infrastructure Doctoral Training camp.

One of our former PPI members and PhD students (Dr Kath Maguire) has been awarded an NIHR Knowledge Mobilisation Fellowship for a project entitled, "Does using the active learning cycle as a model for improving practice enhance the impact and experience of patient and public involvement in health research, education, and service development?"

2. Formal training for PenCLAHRC partners

We have a core programme of training open to staff from all partners and to members of the public. As well as giving participants knowledge and skills these courses promote academic engagement with NHS staff and members of the public and help us elicit uncertainties regarding clinical and policy questions.

Training offered during the period has included:

- "Making Sense of Evidence (MSE)" Workshops in a wide variety of formats covering introduction to research, literature searching and critical appraisal skills in relation to trials, systematic reviews, and diagnostic and qualitative studies (32 workshops for 659 delegates including physiotherapists, nurses, midwives, GP trainees, ED staff and service users). Having two dedicated GPs funded a day per week has helped to increase our reach with workshops being held in Devon, Somerset and Cornwall. We regard these workshops as a key activity to help staff get onto the first rung of the "research escalator" as well as providing applicable skills for everyday practice. Formats include both general training and bespoke courses for teams working in a particular area or for single discipline groups who express a need to get basic training before joining open programmes. This is an area of particular strength in PenCLAHRC and course materials from our MSE training are made freely available to any NHS or University staff and wide dissemination is encouraged. Feedback from the workshops is very positive, rating on average 4.5/5.
- In the Exeter Policing, Evidence and Research Translation (ExPERT)study (https://expert-study.com), funded by the Police Knowledge Fund (HEFCE Catalyst Funding), we are working with the Devon and Cornwall Police to train officers and staff to better understand evidence as a basis for improving service delivery. Sixty-three officers and staff have attended workshops in the past year. The project includes secondment opportunities to allow police personnel, researchers, and University of Exeter students to work together to develop research and data analysis skills and apply them to real-world problems to create an evidenced-based approach to policing.
- We ran Operational Research (OR) modelling workshops covering Foundation level, Introduction to modelling, Problem Structuring and Geographical modelling (9 events with 208 delegates). In addition we held a Problem Structuring workshop in Leeds for the Yorkshire and Humber AHSN Improvement Academy (20 delegates)

- We have run 3 courses on using STATA (50 delegates)
- We held a well-attended seminar run by Professor Richards, NIHR Senior Investigator and Nursing Advocate, on NIHR Personal Fellowships
- We run advice clinics for academic and healthcare staff on "Search and Review" (fortnightly), PPI (fortnightly), Statistics (three per term) and Qualitative Research (three per term).
- We have a long-running programme of tutor training in Evidence-Based Practice to promote spread and sustainability. In the current period a further six people have attended the Oxford 'Teaching evidence-based practice' course and joined our 'Making Sense of Evidence' tutor team (three medically qualified, one statistician, and two health service researchers).

3. Staff development

We see our staff as a key resource and have an active appraisal programme in which staff and line managers are encouraged to focus on training and development needs. Our partner universities have extensive training programmes open to staff and we supplement these with external courses and opportunities for secondments as well as providing access to the training opportunities listed above.

4. Developing methodological skills for NHS staff

Staff who propose clinical or policy uncertainties that are adopted as part of the CLAHRC are encouraged to maintain involvement with the resulting projects both to ensure the continuing relevance of the research to practice and to enable them to work with methodologists to develop their skills.

Our CLAHRC has developed expertise in the use of operational research modelling as a method to investigate service delivery limitations and challenges and to test *in silico* potential solutions. We have shown with NHS partners that this can form the basis for successful implementation of evidence-based services leading to improvements in patient outcomes. We are undertaking these activities jointly with other CLAHRCs in order to spread expertise.

A demand from our partners for greater access to modelling than we could supply led to the establishment of the Health Service Modelling Associate (HSMA) scheme in April 2016. We ran a one-year pilot where six employees from NHS Trusts across the region were released one day a week to develop operational research skills and work on modelling projects of strategic importance to their organisations. Questions addressed in this programme of supported learning and capacity development include:

- What are the bottlenecks and delays in getting out-of-hospital medical cardiac arrest patients to definitive care?
- How would the addition of a CDU affect patient flow and waiting times at RD&E A&E?
- What are the current constraints/ bottlenecks within the acute eye service and how can we minimise them?
- How do we reduce bottlenecks (delayed discharge) in the Mental Health Acute Care Pathway?
- What will be the impact of changes to the North Devon District Hospital A&E?
- How would variation in patient discharge rates throughout the week be affected by a Medical Specialist Registrar dedicated to discharge review over the weekend?

All six of the projects undertaken by the HSMAs have produced important findings for their organisations and have informed decision making through supporting business cases, change programmes and informing local Sustainable Transformation Plan's (STP's). Following the success of this year's programme, we are working with our partner organisations to support them to further embed operational research practices within their organisations and to ensure the continuation of the programme, with another round planned for later this year.

We are keen to work with groups of clinicians who wish to increase capacity in their areas as we see this as the basis for future productive research and service improvement. We have fostered a relationship with the South West Anaesthesia Research Matrix (SWARM) and have jointly supported a Research Fellow. Dr Tori Field (Aug 2015-Dec 2016), gained research experience while conducting a project agreed by local clinicians on comprehensive mouth care to reduce post-operative pneumonia. The project data have been incorporated into the design of a national study. Dr Tim Warrener (Dec 16-Aug 17) will be working on a number of research projects. Beyond the studies, the outcomes will be far reaching and hopefully have much longer lasting effects. Doors and minds have been opened for interested trainees to engage with research in the future: an accessible avenue to pursue alongside their clinical careers. Due to the success of this activity a new SWARM Fellow (Dr Johannes Retief) and a Physiotherapy Fellow (Emily Rogers) have been appointed to commence later in 2017 to continue to build research capacity amongst clinicians working with complex older people.

6. LINKS WITH NIHR INFRASTRUCTURE AND THE WIDER INNOVATION LANDSCAPE

A significant strength of CLAHRCs has been the establishment of cross-CLAHRC links with regular meetings of Directors and Programme Managers, coordinated by a jointly funded Partnership Programme. These meetings serve multiple purposes including sharing knowledge and skills and facilitating liaison with bodies such as NHS(E).

There are a series of cross-CLAHRC groups with common methodological or subject interests including PPI, OR Modelling, Economics, Stroke, and Mental Health Groups in which our staff are actively involved. PenCLAHRC hosted the recent cross-CLAHRC Child Health event, which will now be a regular event, and with 5 other CLAHRCs has funded and helped coordinate the cross-CLAHRC PROMs event.

We want to ensure that the impact of CLAHRC projects crosses regions. A recent successful example is a collaboration which has used research and implementation expertise from the Oxford CLAHRC to support the implementation of an Integrated Psychological Medicine Service across the Royal Devon and Exeter Hospital. This services aims to provide 1) routine psychological assessments to patients attending the acute hospital, 2) a workforce trained in responding appropriately to psychological distress, and 3) availability of suitable psychological / drug treatments for mental disorders, delivered using a stepped-care model.

As discussed in section 11, we are developing a strategic alliance with CLAHRC NT to make the most of opportunities for research and capacity building. We share interests in areas including modelling, capacity building (including expansion of HSMA programme), person-centred care, child health, and older people/ multimorbidities. We have areas of complementary expertise and the very different populations and service configurations offer excellent opportunities to test the applicability of research.

We work closely with the South West AHSN, which is a significant partner for many of our activities within the local health economy. We share the same geography and the same partner organisations. Our overlapping aims, particularly with regard to service improvement and evaluation and spread of innovation, make cooperation imperative and fruitful. There is cross representation across the organisations including at Board level and on prioritisation and working groups. This helps both organisations to remain connected to the needs of our NHS partners with shared opportunities to identify their priorities. Specific joint projects include the Person-Centred Coordinated (P3C) programme to support new models of integration; improvements in acute stroke care; establishment and evaluation of patient initiated clinics; a DH-funded evaluation of Patient Safety Collaboratives and effective use of diagnostic strategies in acute chest pain. The AHSN provides an important conduit for PenCLAHRC to gain access to industry and third sector organisations, In this area, the development of the £5 million Social Investment Fund by the AHSN is offering a unique opportunity for collaborative development of service innovation and delivery. We are currently contributing to the SW AHSN re-licensing bid. Our OR modelling group has recently begun work with the Oxford AHSN and Newcastle University on a national study of the location of thrombectomy centres for stroke victims.

We also have strong collaborations with other parts of the local NIHR infrastructure including:

- **NIHR Research Design Service (RDS) South West.** PenCLAHRC and the RDS work together to maximise potential benefit from research. RDS staff have provided methodological input to a number of successful grant applications and are joint applicants on several of projects including a recent £6 million grant application for a trial of tranexamic acid to prevent blood loss in patents with hip fractures. Research questions considered through our identification and prioritization systems which are unsuitable for PenCLAHRC are passed on to the RDS.
- **NIHR Clinical Research Network (CRN): South West Peninsula.** Eleven current projects (all with additional external grant funding) are currently being supported by the CRN. The CRN provides training for staff and for PhD students. Along with the AHSN we are supporting the CRN-led “Drive” project to further streamline the process for study approval and opening.
- **NIHR Exeter Clinical Research Facility.** We have developed shared standard operating procedures, joint training, and collaboration between methodologists.
- **Peninsula Clinical Trials Unit (PenCTU).** This unit is supported by an NIHR Clinical Trials infrastructure grant. Many of the larger clinical trials within the PenCLAHRC portfolio involve collaboration with PenCTU.

Health Technology Cooperative (Devices for Dignity, D4D). As part of our work on osteoporotic vertebral fractures we are working with D4D to develop a prototype support garment for people who have suffered a vertebral fracture (**DiScOVer**).

7. LINKS WITH INDUSTRY

Engagement Strategy

From the outset, our aim in PenCLAHRC has been to work with as wide a range of industrial partners as possible. We remain committed to this aim and have, in the past twelve months, both built on existing industrial engagement that aligns with this aim and formed new partnerships that enable us to move towards and achieve it. Our relationship with the South West Academic Health Science Network (AHSN) remains central to our strategy and continues to prove productive. As well as working with AHSN colleagues on ad hoc relationship-building and engagement with specific companies, we have supported the establishment of their £5 million Social Investment Fund, joined the strategic advisory board of the Transform Ageing programme that the AHSN co-runs with the Design Council and UnLtd and which will develop new ways of providing health and social care by developing private and third-sector innovation, and worked closely with AHSN colleagues to support innovations identified through the NHS-England supported Small Business Research Initiative for Healthcare (SBRI Healthcare).

We have excellent ongoing relationships with a number of industrial partners. In the medtech/devices sector these include:

- Sharp Clinical Services, a leading provider of clinical supply chains services including product development and manufacture, whom we anticipate will provide tranexamic acid and placebo for the **HipFrac TXA trial**
- DM orthotics, with whom we have a long-term collaboration as part of our work on osteoporotic vertebral fractures (**DiScOVer project**).

In the non-life-sciences sector our industrial partners include:

- Simetrica, who are undertaking a social return of investment analysis for the **C2 project** using the Beacon Partnership as an exemplar
- Plymouth Community Homes, a major local provider of affordable housing, and Sovereign Housing, one of the largest housing associations in the country
- Lightfoot Solutions, the international analysis and organisational change specialists, who have provided us with in excess of £100k-worth of data and analytics this year
- Simul8, the simulation software developer and implementer, with whom we now have an extensive track record of collaboration including work as part of our very successful Health Service Modelling Associates programme
- Oxygen House (formerly Andromeda Capital), who are funding aspects of the C2 project related to community connectivity.

UK Small and Medium Enterprises (SMEs)

Because of our geography and the shape of our local economy, working with SMEs is at the heart of our strategy for engaging with industry. In the reporting period we worked with 52 SMEs and are keen to increase this number in future years. In strategic terms, our focus remains on maintaining and developing existing collaborations while actively seeking new ways of engaging and working with SMEs whose activity is aligned with our strengths and aims, both locally and further afield.

We feel there are three areas in which our engagement with SMEs is worth highlighting because of their strategic importance to us or because they are areas that we wish to develop further:

- Arts and culture
- Children and young people
- Long-term care.

Working with *arts and culture* SMEs has become increasingly important to us in a number of projects. In our **Group Singing for Aphasia** project our collaboration with Plymouth Music Zone has been crucial. Collaborating closely with dance, theatre, and performing arts organisations has also been central to our **HeLP** project on childhood obesity where local partner organisations include Just4Funk Productions, Head Bangers Theatre Company, and Attik Dance.

Across our themes a number of programmes of work focus on the health and wellbeing of *children and young people* and, in consequence, we do some exciting work with SMEs that help and support these groups. For instance, the **Family Vision** project involves working with Action for Children, Exeter Community Initiatives, and Get Up and Grow Coaching Ltd; staff on the **STARS** project have worked alongside the Kristin Cain Consultancy to do work that supports children with social and emotional difficulties; and the Mindfulness in Schools Project (MiSP) is training teachers as part of **MYRIAD**.

The third area, and largest in terms of the number of partners and collaborations, relates to SMEs working in *long-term care*. We have several linked pieces of work grouped together within the Care Home Implementation and Knowledge Mobilisation Project (**CHIK-P**) and as part of this we work with a diverse range of provider SMEs including homecare agencies (e.g. Diamond Care), small private providers (e.g. Belmont Grange Residential Home), medium-sized chains (e.g. Somerset Care Group), and a local network of for-profit and not-for-profit providers, the Devon Care Kite Mark. In addition to specific projects with these organisations we are actively involving them in our attempts to define a research agenda around improving health of care-home residents homes and have a workstream that aims to understand how these organisations currently make use of evidence as a basis for future implementation.

Strategic Partnerships

Our long-term strategic partnership with Lightfoot Solutions continues to provide substantial benefit. We have new strategic partnerships in place with Oxygen House (formerly Andromeda Capital) and with DECIPHer-IMPACT.

We are collaborating with Nestlé through their Nestlé Institute of Health Sciences as part of the Earlybird 3 project.

8. MATCHED FUNDING

Matched funding for PenCLAHRC comes from multiple sources including NHS organisations, the AHSN, the partner Universities, charities including Cerebra and the Alzheimer's Society, and the private sector. The source of funding has a substantial influence on the purposes for which it can be employed. In this period the total matched funding attracted was c £2.3 million (Research c.£1.7m; Implementation c.£600k) against a target of £1.5 million. Only a small sample of projects supported by matched funding can be reported. Our strategy explicitly aims to be responsive to the needs of decision makers and projects often cross themes and frequently include elements of both implementation and research.

Key activities and achievements supported by matched funding

1. **Person Centred Coordinated Care (P3C)** ***(Person Centred Care Theme)***

As reported elsewhere, we have a substantial set of projects related to the integration of services across primary and secondary care and between health and social care, supported by matched funding from the AHSN, NHS(E) and Torbay Hospital Trust. These projects are not only providing rapid evidence to those designing the services but have also led to the development of two methods for evaluating the extent which such services are succeeding in delivering person centred care. These measures are being widely used in the UK and recently adopted by researchers in the USA and Australia. A guide based on this work to the "commissioning, implementation and development of person centred coordinated care (P3C)" for NHS Commissioners has now been signed off by NHS(E) and will be released after purdah.

2. **Support for Operational Research Modelling** ***(Evidence for Policy Theme)***

PenCHORD, our operational research modelling group has conducted a large number of projects during the last 12 months, all either externally funded or supported by matched funding from the NHS or AHSN. The close involvement of NHS colleagues (which provides "in kind" match) is crucial to ensuring that the solutions tested within models are applicable and feasible within the clinical context. A major area of work continues to be the modelling of pathways for the care of acute stroke where we have documented health gain resulting from implementation of changes. Other areas where staff have worked with NHS services to achieve service improvement include reducing waiting times for bladder cancer treatment, reducing A&E breaches, and optimising the location of

outpatient services, The Heath Service Modelling Associates (see Added Value Example) are seconded to work part time with the team, learning new skills and addressing problems of direct relevance to their host organisations.

3. **Service Improvement and Research in Orthopaedic Care (*Person Centred Care and Evidence for Policy Themes)***

Staff from the RD&E orthopaedic, anaesthetic and ED departments have been involved in the development of research and implementation projects. The first project attempts to address the problem of excess blood loss amongst elderly patients with hip fractures. After reviewing the evidence the team have applied for funding from NIHR to conduct a definitive trial on the use of tranexamic acid prior to surgery. The second, in the same group of patients, concerns the delivery of effective early pain relief while reducing the risk of opiate-associated confusion. The team are working with the Ambulance Trust to pilot the use of regional blocks by paramedics before patient transport to hospital.

4. **Evidence to improve the care of disabled children *(Person Centred Care Theme)***

Cerebra provides substantial matched funding for PenCLAHRC to generate and disseminate evidence of relevance to children with disabilities and their families. We work with the charity and with our "Family Faculty", made up of over 300 members with disabled children who are partners in the choice, design and delivery of research projects. Two of the current projects supported by the charity are:

a) Disabled children are disproportionately likely to be admitted to hospital and families and hospital staff recognise the challenges of effective communication. Advised by the families, we reviewed existing evidence of children's experiences and conducted qualitative studies of staff perceptions. We have now designed and conducted early evaluations of an intervention to help staff improve their skills and are moving to the second phase of evaluation in three further paediatric services.

Parents with disabled children experience particular challenges to their health but have difficulty accessing appropriate services. We have piloted an intervention, co-designed with parents, and are seeking funding with colleagues in Melbourne for formal evaluation.

9. FORWARD LOOK

This is a time of considerable uncertainty in the NHS and in Social Care, with both operating under severe financial constraints in the face of increasing demand. This places significant extra pressure on academics engaged in patient-focussed research and with attempts to more effectively use evidence to improve services. There has always been a disjunction between research timescales and the need of the health service for rapid decision-making and the tension this creates has grown in the face of austerity.

We remain convinced that, despite these challenges, close engagement with decision makers – clinicians, NHS organisations and members of the public - to identify and attempt to resolve key uncertainties increases the likelihood of producing research with a high chance of influencing practice and policy. Over the past 9 years within PenCLAHRC this approach has led to research with genuine relevance to practice and helped us to facilitate service improvement with local and national impact.

If our research is to have maximum impact it needs to be relevant to the needs of different communities and systems. Much of our existing research has been conducted with partners in other CLAHRCs and other universities and a number of projects can demonstrate impact beyond our

region. However, we are keen to ensure that this approach is more effectively institutionalised in the future. We have therefore agreed a partnership with CLAHRC North Thames to build a consistent approach to reaching and including our diverse population from the rural elderly to multiply disadvantaged BME communities. We are establishing a standard process whereby we assess the feasibility of undertaking current and future research and of implementing our research findings across both sites. Our partnership also embraces capacity building and shared learning. We are sharing best practice across our teaching/ training domains and plan to co-build capacity, particularly in operational research, child health research, the design and evaluation of integrated health services and in public health. This partnership represents a step change in current collaborations across CLAHRCs in that it moves away from an opportunistic approach toward a more explicit, standard and consistent policy.

Amongst the areas which we believe will offer particular opportunities for impact within the next year is operational research modelling (PenCHORD). Some of the impacts of this programme are highlighted elsewhere in the report and we plan to continue to invest and to expand our research examining how we can most effectively use this technique to underpin service improvement. The successful HSMA programme (section 7) which allows NHS organisations to second staff on day release to learn the techniques while working on problems relevant to their organisations offers us the opportunity to help them solve particular problems and to establish a cadre of skilled staff in the local health economy with whom we can work in the future.

The success of the HMSA programme has led us to seek to develop a programme of Health Service Implementation Science Associates which we hope will offer a similar opportunity for seconded health service staff to build skills working with our Implementation Science group while addressing a specific problem relevant to their employers.

The challenge of increasing demand and shrinking resources is driving attempts to integrate primary and secondary care and health and social care. The difficulty for services is to make the best use of evidence in designing these initiatives and to evaluate them in real time. Our work in the Person-Centre Coordinated Care initiative has aimed to develop and validate tools which help services to attempt to meet this challenge. These tools which include a measure which aims to assess patients' experiences of person centred and coordinated care and an implementation and reporting tool to measure and support organisational change have been widely adopted in the UK and internationally. We will use results from these ongoing research programmes to help guide further developments in this area.

We believe that the progress against our key objectives that we have documented in this report, vindicates our original approach to CLAHRC and we will continue to build on this foundation. The challenge facing us now is how to ensure the continuation of success in a rapidly changing NHS and, more widely, public service context; changes which pose considerable challenges but which we believe also offer us significant opportunities. The current NIHR funding for the CLAHRC ends in 2018. A key challenge for the next year is to ensure that we are able to use whatever future opportunities arise in this space to preserve the legacy of the current CLAHRC and continue to contribute to the gaining health benefits from research.