NHS
National Institute for Health Research

COLLABORATION FOR LEADERSHIP IN APPLIED HEALTH RESEARCH AND CARE SOUTH WEST PENINSULA (PENCLAHRC)

Annual Report for period 1 January 2014 to 31 March 2015

1. Overview of PenCLAHRC activities during reporting period

The overriding aim of CLAHRCs is to promote the generation and use of patient-focussed research evidence in order to benefit the health of the population. In our bid to NIHR, we set out three major objectives for PenCLAHRC:

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

As additional aims we have sought to contribute to the growth agenda and to influence the culture in partner NHS organisations towards the more effective use of evidence and amongst academic partners towards a clearer focus on research impact.

We have set a number of short- and medium-term goals for the CLAHRC to enable us to meet these main objectives. These goals focus primarily on creating supportive systems, engaging partners, and maximising the use of our research capacity. During the pilot CLAHRC phase we had made substantial progress against these objectives and we have successfully continued this progress during the period covered by this report.

PenCLAHRC strategy
Our strategy depends on 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. Failure to achieve effective use of research evidence is, in our view, in part the result of a failure of evidence to address the real concerns of these groups and to develop knowledge that is meaningful within the contexts in which they operate.

We have taken multiple approaches to achieve engagement and to deliver this partnership. Representatives of all of these groups, including members of the public, are embedded within our organisational structures to ensure strategic decisions are shared by stakeholders. All partner organisations (along with representatives of PenPIG, our public involvement group) have a seat on the Management Board and on the Stakeholder Group that prioritises research questions. We have developed explicit mechanisms to elicit the “uncertainties” that reflect problems facing decision makers; where these uncertainties have been prioritised for further research we have kept involved those who raised them to maintain relevance to practice.

As well as health and social care partners we have made a significant effort to engage with third sector organisations and industry. Our engagement with industry is significantly expanding through working more

closely with the AHSN. Finally, we deliver training and education, ranging from one-day courses to PhDs, explicitly designed to build capacity.

The drive to elicit uncertainties is closely linked with programmes aimed to build capacity amongst partner organisations (and members of the public involved with our projects) to be able to extract from complex clinical and policy questions key information needs and translate these into answerable questions.

Applied health research

A key part of our research strategy has been to use NIHR funding to provide the human infrastructure which allows us to seek preliminary data (sometimes producing stand-alone studies) and apply for grant funding for definitive studies that directly address important uncertainties for practice. Our process for the elicitation of these uncertainties has developed in response to evaluation of the pilot CLAHRC and covers uncertainties in implementation as well as research. We have more closely aligned this process to our "Making Sense of Evidence" programme so that our activities in improving both the use and generation of evidence are mutually informing. We have also identified some broad issues of concern to groups of stakeholders, such as delivery of services in care homes and integration of primary and secondary care. Meetings in relation to these areas build a shared understanding of the problems and potential solutions while also building partnerships to take forward research and implementation activities.

A number of studies we began during the pilot CLAHRC phase continue, some as externally funded projects still linked to PenCLAHRC. 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. This can lead to tension with some partners who find it hard to see the direct relevance of the CLAHRC to their needs. The results of previously developed projects are allowing us to demonstrate how these can impact on service provision and hence increase support for our activities.

In this period we made a strategic decision to significantly expand our portfolio of projects in the area of implementation science. The Evidence Synthesis Team are conducting a series of systematic reviews around barriers and facilitators to implementation, most recently being funded by the Alzheimer's Society to review these in the context of dementia services. The appointment of a Senior Research Fellow with skills in Realist Reviews has increased our capacity in this area as has the award of an NIHR Knowledge Transfer Fellowship to Dr Iain Lang. A new joint programme with the AHSN will use ethnographic approaches to evaluate what factors have hindered and helped our implementation of evidence-based approaches in the design of acute stroke care and in the use of patient initiated clinics as a way of organising outpatient services in chronic disease.

Our patient involvement group, PenPIG, has taken an increasingly prominent role in our research. We have a record of seeking to answer questions posed by members of the public and by including them as individuals in study design and as co-applicants on grants. In our *Person-Centred Care Theme* they are now working as a group to help develop new theoretical models of what should constitute "Person-Centred Care" which can be evaluated.

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

PenCLAHRC has worked with NHS partners, and with the AHSN and Strategic Clinical Networks, to increase the effectiveness of evidence implementation. This work builds on two fundamental principles:

- In PenCLAHRC research we attempt to incorporate "implementability" throughout the research process including question selection, intervention design, selection of appropriate outcome measures, research conduct, and research dissemination. By involving end users at all stages we ensure we can identify interventions that are not only effective but are feasible and acceptable to organisations, clinicians and patients. The synthesis of evidence, guided by those who will use it, is a necessary but insufficient step in this process

- Context is crucial and design of implementation strategies is preceded by diagnostic evaluation of potential barriers and facilitators at the levels of system, organisation, team, and individual, with strategies tailored to address these. Our approach has been strengthened by the increasing use of systematic reviews of topic-specific implementation research. Potential projects are approached by building an appropriate team on the topic area including end users of information, academics, and managers to ensure strategies take account of the best evidence regarding the proposed interventions, knowledge from implementation science, and contextual factors.

Capacity building (See also Section 5)
Our drive to increase the capacity of staff within the local health economy to use and generate evidence has three strands:

- ***PhD studentships***
  11 PhD studentships were planned within this period of PenCLAHRC. We were awarded funding for a further four studentships from the Research Capacity in Dementia Care Programme (RCDCP), specifically aimed at nurses and professions allied to medicine. We are delighted to report that we have successfully recruited to all studentships with 13 students already in place and two more due to start by August

- ***Explicit training***
  As part of our drive to elicit uncertainties and build capacity to engage with evidence we deliver training in evidence-based practice, research methods, and operational research. This training is delivered in multiple formats including short courses aimed at all disciplines and training provided to teams or individuals with a common disciplinary base. Of particular importance to us is the offer of this training to members of the public engaged with our programmes. In addition to the intrinsic benefits, the relationships developed during these formal teaching sessions have been instrumental in implementation of evidence and generation of research projects

- ***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. A large number of PenCLAHRC projects include NHS staff as partners; others work with individuals and groups from other public and third sector organisations.

It is important to note that we regard capacity building amongst academic staff as equally important to capacity building in the NHS. In particular we aim to develop their capacity to address questions of direct relevance to users and providers of services, and their interest in doing so, while retaining academic rigour.

Wealth creation
PenCLAHRC's contribution to the wealth creation agenda is both direct and indirect. We work closely 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 however is through the design and evaluation of more effective and efficient services, freeing resources and contributing to improved health of the population with its knock on effects on productivity. In addition we have a developing programme of research on the creation of workplaces.

Key achievements in the period

1. **Building an effective partnership with the AHSN**
   A key difficulty during the pilot CLAHRC was trying to scale up implementation and capacity building. The development of the AHSN and our increasingly close working relationship have enabled us to substantially improve our performance in this regard. We now have a number of joint projects, often involving Strategic Clinical networks as well. These projects include areas such as the design and implementation of new pathways for Acute Stroke Care, Patient-Initiated Clinics in chronic disease,

design and evaluation of Person Centred Integrated Care, Pathways for Implementation of High-Sensitivity Troponin and improved delivery of Unscheduled Care for Children. These projects are leading to direct changes to services and providing invaluable opportunities for implementation science research, also being conducted jointly with the AHSN

2. **Further development of PPI(E) (see Section 4)**
   Involvement of the public has always been at the heart of NIHR PenCLAHRC. As we moved from the pilot period into the new phase, including adding new partner organisations, the challenge was to maintain this effective voice in the PenCLAHRC structures and to try to ensure that we gained the maximum benefit from involvement across our work. We believe we have succeeded in doing this and have expanded public involvement in areas such as systematic reviews and, for the first time, in operational research modelling. These activities have drawn strength from closer working with PPI groups in partner organisations including the CRN, the SCNs and partner Trusts. We have also enhanced our empirical and theoretical exploration of the effects of PPI on the design and conduct of research

3. **Attracting external grant funding**
   We have continued to attract substantial amounts of external research funding with income in the twelve month financial reporting period of over £5.3M. We have also recently had success in attracting a significant number of new grants which will be realised during the next reporting period.

Summary
We have expanded the number of partner organisations within PenCLAHRC from 15 during the pilot phase to 22 currently. This has resulted in a geographical footprint conterminous with that of the AHSN and involving all NHS organisations within this area. The expansion presented some challenges but the success of our strategy to promote engagement is demonstrated by the fact every partner organisation contributed senior staff to our recent prioritisation event.

Research which attempts to respond to the information needs of providers and users of health services is at the heart of the PenCLAHRC strategy, building on close relationships with partner organisations, extensive opportunities for public involvement, and a programme of capacity building for all those involved in the local health economy.

2. Progress Made in Each Research Theme

A key principle of our strategy is that research themes should not be seen as silos and cross theme working is the norm. Support, including methodology and PPI, is provided centrally to all themes and most staff work in more than one area. All themes focus on delivering the core PenCLAHRC aims: high quality patient-focussed research, using evidence to achieve health gain and building capacity to use and generate services and have driven the progress dealt with in this report. This section highlights some work not covered elsewhere.

1. Person-Centred Care Theme

Strategy and Leadership (led by Professors Nicky Britten and Richard Byng):
This long term objective is to develop and research the meaning and delivery of Person-Centred Care. Staff work particularly closely with PenPIG as well as with local providers and the AHSN.

Key activities:
Person-centred integrated care and commissioning

- A joint programme of evaluation and practice development with the AHSN and NHS England in relation to Person Centred Integrated Care (PCIC) for individuals with multi-morbidity
- The creation and evaluation with Somerset CCG of a model to enable patients and carers to generate a commissioning agenda for diabetes services, which is potentially transferable to other conditions.

Management of polypharmacy

- Polypharmacy and its effects is a major issue for patients with multi-morbidity and was prioritised during our most recent round of topic selection. We are developing an intervention which puts patients at the heart of optimising the outcomes of treatment and balancing risks. This is supported by developing an innovative agent-based simulation model to explore the impact of behaviours in relation to polypharmacy.

External grants

- Two NIHR-funded projects, Engager2 and Partners2 (circa £4m for both), have developed evidence-informed and theoretically coherent person centred interventions
- Stroke Association funded (£161k), patient-driven evaluation of long-term rehabilitation after stroke.

Development of theoretical perspectives

- Starting with existing theory (e.g. "House of Care"), working with PenPIG to develop 'bottom up' principles of Person Centred Care
- Members of PenPIG are working with researchers on patient-practitioner interactions, including analysis of data from the DIAT trial (DM management) to produce a typology of consultation styles in diabetes clinics.

Implementation

- Driven by concerns about utilisation of outpatient resources, we are working with Plymouth Hospitals Trust to implement Patient Initiated Clinics in rheumatology and other specialties.

2. Mental Health and Dementia Theme

Strategy and leadership (led by Professor David Richards):
This theme has prioritised work in dementia this year.

Key activities
Establishing priorities in dementia care

- Working with people with dementia and their carers, we have identified two major concerns: coordination of care between agencies and professionals in acute illness; and training of staff in care homes.

Coordination and care

- Mapped service provision for people with dementia and carers to inform future service development and research among PenCLAHRC and AHSN partner organisations
- Developing and evaluating Dementia Friendly Rural Communities

Training of Staff

- Evaluation of Dementia Challenge Fund-supported intervention to train Dementia Champions in care homes in the Torbay area. This team won the 2015 BMJ Award for Dementia Team of the Year for their outstanding contribution to the care of patients with dementia (http://static.www.bmj.com/sites/default/files/attachments/resources/2015/05/Awards_2015_bro_lores_final.pdf.

Developing interventions for poorly served populations

- *Stepped care in depression*. We are undertaking a mixed-methods feasibility trial of stepped care to determine the value of a stepped-care decision algorithm

- *Perinatal depression*. After a successful funded pilot the team is submitting an application to trial this supported internet-delivered psychological therapy for women with perinatal depression (NetMums)
- *Suicidal risk*. We have developed a new way to manage suicidal thoughts which will be the subject of an NIHR Programme Grant application
- *Marginalised groups***.** Evaluated a local hospital discharge programme for homeless people with multiple morbidities. This will now form part of a new external funding bit to evaluate this scheme at scale
- *School-age children.* Children excluded from primary school are at high risk of poor mental health and social outcomes. Based on completed epidemiological studies, we are developing an intervention based on early assessment and routing into treatment.

External grants

- Health Education England funding (£63k) to develop curricula standards and principles to support dementia education. The final report can be found here
- NIHR funded, DeCoDer trial (£2.1m) of debt counselling for depression in primary care
- NIHR funded, CADENCE trial (£450k), developing and evaluating a psychological care intervention for patients with new-onset depressive symptoms in cardiac rehabilitation.

Capacity Development

- Six PhD students have dementia related projects, most focusing on developing and testing interventions that can be used by allied health care professionals to address research priorities identified by the James Lind Alliance and Alzheimer's Society prioritisation exercise.

3. Evidence for Policy and Practice Theme

Strategy and Leadership (led by Professor Ken Stein):
This theme incorporates the Peninsula Collaboration for Health Operational Research and Development (PenCHORD) and the Evidence Synthesis Team (EST). The EST supports the prioritisation process, which helps establish elements of PenCLAHRC's work programme, as well as conducting research syntheses.

Key activities:
Modelling by PenCHORD to support implementation

- Two collaborative projects (Stroke Clinical Network/AHSN part-funded) for acute stroke: a) An extension of the pilot CLAHRC access to thrombolysis modelling project across all partner hospitals; b) Geographical modelling of configuration of acute stroke units
- Modelling change to configuration of units undertaking primary percutaneous coronary intervention (PCI), also in collaboration with the South West Clinical Network for Heart and Stroke. This work is informing a regional review by NHS England.

Implementation

- ASPIC: an ethnographic investigation into the factors at play in the implementation of change in relation to two PenCLAHRC projects: acute stroke modelling and Patient Initiated Clinics
- Building on EST systematic reviews (2014) on mealtime practices and reducing antipsychotic prescribing in nursing and care homes, we are working with care homes to improve uptake of evidence relevant to community health and social care.

External grants

- Alzheimer's Society (£64k) funded systematic review of dissemination and implementation research in dementia care
- AHSN (£123k) and SCN (£80k) funded modelling in relation to thrombolysis and PCI
- NIHR HSDR (£336k) funding for development of a national model of neonatal intensive care.

Capacity Development:

- The PenCLAHRC EST continues to support the development of capacity in conducting systematic reviews across the CLAHRC themes (e.g. on the benefits of TNF-alpha on depression in chronic disease in the Mental Health theme)
- PenCHORD is developing a modular course in Operational Research (OR) for Healthcare, working closely with a Reference Group of PenCLAHRC stakeholders
- A seminar series on a range of OR topics has been extremely well supported by NHS staff and resulted in the launch of The "Healthcare Associates" scheme in 2015 to allow NHS staff to be seconded to PenCHORD in order to carry out modelling projects with the support of academic OR experts.

4. HEALTHY PEOPLE, HEALTHY ENVIRONMENTS THEME

Strategy and leadership (led by Professor Charles Abraham):
This theme includes both research linking health and the environment in which people live and research on methods for changing behaviour at individual, social and organisational levels.

Key activities
Environment and Health

- With the European Centre for the Environment and Human Health, a number of studies have evaluated the link between place and health, particularly "healthy seas" and human health
- An evaluation of "Green Prescriptions" in Primary Care was prioritised by PenCLAHRC in 2014 and an intervention is being developed. External funding will be applied for to conduct an evaluation.

Evaluation of preventive initiatives

- We are in the final stages of a funding application for the development and evaluation of an intervention for health promotion among offenders
- We are about to submit a funding application for the Young Persons Engagement Study (Yes!), designed to support obese adolescents and their families to support a healthy lifestyle.

E-health

- Development and evaluation of interventions using Web 2.0 and smartphone technologies in behavioural interventions for weight management.

External grants

- C2 – Connecting Communities: supporting resident–led neighbourhood partnerships to improve health and wellbeing and reduce inequalities in deprived neighbourhoods has funding from CCGs and local authorities (£450k) to continue the evaluation and implementation
- NIHR funded E-coachER trial (£1.4m) is evaluating web-based coaching added on to the Exercise Referral Scheme increase uptake of physical activity and sustained health by patients
- The NIHR funded STARS trial (£1.8m) is evaluating the effect of teachers' skills and training on the behaviour and learning of school children.

Capacity Development

- Four PhD students, two funded by Shell, are working on projects within this theme including exploring the use of functional imagery training as an eHealth intervention for weight loss and evaluating interventions at mealtimes to improve health and quality of life of older people in residential care
- Short courses for researchers and practitioners on process evaluation and on how to evaluate public health interventions.

5. Diagnostics and Stratified Medicine Theme

Strategy and leadership (led by Professor Chris Hyde):
This theme conducts primary and secondary research on diagnostic strategies and uses findings to develop and spread the use of evidence-based diagnostic pathways.

Key activities
Reducing unnecessary tests

- UNTEST has investigated the rise in ordering of routine tests, using thyroid function, as an exemplar, has documented and sought to explain a 6 fold variation between practices. We are now developing interventions to reduce inappropriate test ordering.

Stratifying diabetes care

- Funding from Welcome and MRC has allowed exploration of patient stratification in diabetes using genetic and other markers.

Diagnosis in acute chest pain

- A review of the effectiveness of high sensitivity troponin tests, supported by NICE guidance, forms the basis for AHSN-funded modelling of the potential implementation of this approach.

Coagulation in severe trauma

- A Cochrane review of the accuracy of new tests for measuring coagulation in severe trauma will provide a basis for designing a cost-effective model for implementation in trauma.

Dementia

- A suite of Cochrane test accuracy reviews on diagnostic techniques in dementia, such as Positron Emission Tomography (PET) scanning, will underpin evidence-based approaches in both primary and secondary care.

Capacity Development

- Two PhD students are working in this theme to explore accuracy and feasibility of increasing GP testing for dementia and also evaluating cardiac imaging techniques to help define pre-operative risk of silent myocardial infarction in surgery.

3. Impact on Healthcare Provision and Public Health

PenCLAHRC is committed to using evidence to improve health locally and more broadly. We work closely with partners in the local health economy, especially the AHSN, to ensure our research is relevant to policy and practice. Here we report some work that has directly impacted patient care.

1. **Operational Research Modelling in the re-design of acute stroke care pathways**:
   Research prioritised through PenCLAHRC to understand the consequences of NICE guidance to extend the therapeutic window for thrombolysis after stroke identified the critical importance of delivering thrombolysis as quickly as possible to realise the benefits of this effective treatment without increasing the risk of harm. In a pilot collaboration between stroke physicians, managers, ambulance trust staff, and operational research modellers from PenCHORD, the PenCLAHRC Operational Research group, we used computer simulation to explore the impact of different ways to reduce the time from hospital arrival to thrombolysis ("door-to-needle" time). The process of bringing together stakeholders to model options and understand the data flows necessary to monitor progress has transformed acute management of stroke. Following the implementation of changes mean door-to-

needle time was reduced by 30% and twice as many people received treatment as in the previous year. Currently, as part of a joint project with the AHSN and Strategic Clinical Network we are extending the project to all trusts in the South West. A parallel project, funded by the AHSN with the CLAHRC, is using ethnographic methods to explore the processes of change within trusts and inform implementation efforts.

2. **Redesigning acute care in paediatrics**
   The number of unplanned admissions to paediatric wards has increased over the last 15 years despite an apparent decline in numbers of children with severe illnesses. Reversing this trend is a key priority for one of our CCG partners. After a systematic review of evidence and development of a taxonomy of potential interventions we worked with clinicians in one acute trust to design and evaluate a suite of interventions. This led to a 17.5% drop in admissions in the year following implementation compared to the previous five-year average. Paediatric units from all acute trusts in the South West have now agreed to work together to research the effectiveness of potential interventions while implementing changes designed to improve acute care. Trusts will collect a common dataset and provide data on service changes prospectively to compare to the last five years. This project is another example of work of joint CLAHRC-AHSN work, in this case in both the SW Peninsula and West of England areas.

3. **Improving the detection of cancer**
   Professor Willie Hamilton's research group (*Diagnostics Theme)* investigates methods for early detection of cancer in primary care and he has recently led the updating of NICE guidance on this subject. This was an enormous revision, covering 30 separate cancer sites in adults and children, and Prof Hamilton's team has provided much of the research evidence underpinning the new recommendations from NICE. In many of the areas NICE identified in their systematic reviews, the sole evidence was from Prof Hamilton's team (e.g. myeloma, microscopic haematuria, breast cancer, uterine cancer and lymphoma). The work has also yielded a range of tools to support the referral of potential cancer by primary care physicians and PenCLAHRC is focusing attention on the implementation of these tools.

4. **Increasing the effectiveness of outpatient management of rheumatoid arthritis**
   Rheumatoid arthritis (RA) is a fluctuating condition and patients frequently complain that routine clinic appointments are often booked during periods of disease quiescence while it is difficult to access specialist care when their condition worsens. A systematic review carried out by the PenCLAHRC Evidence Synthesis Team in the pilot CLAHRC found good evidence to show that allowing appropriately selected patients to select when to see their consultant leads to decreased service use and improved satisfaction. Following this we are (a) collaborating on a project to implement "Patient Initiated Clinics" (PICs) in RA in a local NHS Trust and (b) developing and evaluating, with the AHSN, a generic approach to implementing PICs that could be applied in a range of conditions. Over 400 patients are being followed up in the RA study, relieving pressure on outpatient waiting times and increasing patients' control over their care.

4. Patient and Public Involvement and Engagement

Building on a strong tradition within our partner organisations, patients and members of the public have been at the heart of PenCLAHRC activities from the outset. Our commitment to this way of working is driven by both ethical and practical considerations and is central to all we do. The final arbiters of healthcare decisions are the consumers and we believe significant health gain is far more likely when they are part of all aspects of research: helping delineate uncertainties, design and conduct studies, and disseminate and implement results. We have shown that extensive public engagement leads to more effective research including better recruitment and retention amongst groups traditionally seen as hard to involve in research.

Central to our ethos is ensuring working with members of the public is seen as "normal business" and resourcing this work in the same way as methodological involvement. We believe that "involvement" and "engagement" are inextricably linked but (as requested) report them separately here.

Involvement strategies
We have continued to broaden the scope of our involvement. We have developed complementary PPI strategies with the South West AHSN, the South West Peninsula CRN, and the Exeter Clinical Research Facility's Exeter 10,000 project. Dr Andy Gibson, who has led our PPI team for the last five years, has been appointed to an Associate Chair at the University of West of England (UWE). He will lead the PPI stream within the West of England CLAHRC and this appointment will help us in our plans to develop PPI regionally.

We continue to research different approaches to involving the public in research. For instance, we have run several 'cube' workshops (Gibson et al. *Health* (2012) 16(5): 531-547) and are about to submit further papers on the practical impact of the theoretical cube framework. We are also developing a funding proposal, in collaboration with Dr Gibson and UWE, to use the Patient Involvement Impact Assessment Framework to assess the impact of PPI across several CLAHRCs. We consider PPI as having the potential to contribute to every PenCLAHRC project. We particularly support PPI involvement in forms of research where this is unusual, such as analysis of qualitative data, systematic reviewing, and operational research (e.g., Pearson et al. *Operations Research for Healthcare* (2013) 2:86–89).

The PPI team conducted a very thorough engagement/involvement exercise in preparation for our most recent research question generation and prioritisation round. Members of PenPIG, our patient involvement group, were centrally involved in short-listing and final selection of projects. Members of the PPI team (including members of PenPIG) support individual researchers in writing grant proposals and delivering PPI for specific projects. An example of the effect of effective PPI in a research project is the NIHR-funded HeLP trial of an obesity prevention intervention in schools (*see Added Value Example*). The trial has been delivered with virtually universal involvement of eligible children and over 95% follow-up at two years in secondary schools – such high retention rates are very rare in trials of this type. The team has provided training in PPI for AHP interns in Plymouth, on the MBBS course, and in our newly established MSc in Applied Health Services Research. We continue to provide training and support to our PPI colleagues on specific research methodologies as and when needed, for example in understanding systematic reviews and provide lay members with thank you payments for their work as well as reimbursing travel expenses.

Members of PenPIG sit on the CLAHRC Management Board and other committees and ensure PPI is a standing item for discussion at a strategic level and for individual projects. PPI publications, conference papers, media, and training events are reported to the Strategic Executive Group (SEG) and PPI involvement in individual projects is monitored by the Project Oversight Executive Group as appropriate.

Public engagement strategies
Our PPI team runs a wide range of engagement activities with socially and geographically diverse audiences in the community, NHS and academic settings. This includes extensive work with schools and young people (including training on how to assess evidence), with the voluntary sector, and with Local Authority staff. Our engagement work includes the development of materials, often in the form of games, to facilitate discussion and workshop participation. Many participants in our workshops have gone on to become actively involved in our other research activities or those of our partners.

5. Training

Improving the capacity for the effective use and generation of evidence within our local health economy is one of our key aims. As described in section 3, this includes a large number of PhD studentships, training in specific aspects of research/implementation, and opportunities for NHS staff to develop skills by working with PenCLAHRC staff on projects. We actively encourage the participation of members of the public in our training programmes.

PhD programmes
We have a total of 15 PhD trainees, eleven funded directly through PenCLAHRC and a further four for whom we applied for and won funding from the Research Capacity Dementia Care Programme (RCDCP) – these additional studentships are for clinicians from professions other than medicine. Thirteen of our students have now commenced their studies and the remainder will have started by August 2015. The RCDCP programme is led by Prof Dave Richards, NIHR Academic Training Advocate for Nursing, and PenCLAHRC *Mental Health and Dementia Theme* lead.

All students benefit from the training opportunities provided by Researcher Development Programmes from both partner Universities, irrespective of their University of registration. In addition to the routine supervision provided by their PhD supervisors, students meet quarterly with our Training Lead, Dr Vicki Goodwin, to ensure that full use is made of training opportunities locally and nationally. All PenCLAHRC students meet regularly as well communicating via the NIHR Hub and the seven students whose topics relate specifically to dementia meet fortnightly with key supervisors to develop a community of practice. In addition, the NIHR CRN with whom we work closely have agreed to provide GCP and consent training and ensure that students understand the NIHR family and the opportunities it offers. Two of our trainees attended the 2014 NIHR Training camp and two more have been selected to attend this year. One of our trainees has applied for the Doctoral Exchange Scheme in conjunction with CLAHRC South London. A further 34 PhD students funded from other sources are supervised by PenCLAHRC staff. Since January 2015 we have had seven PhD completions and a further five are awaiting viva.

Training in the use and generation of evidence
We offer a large range of training opportunities. As well as providing participants with knowledge and skills these courses promote engagement with NHS staff and members of the public and help us elicit uncertainties regarding clinical and policy questions. Training offered during the period includes:

- Fortnightly 'Search and Review' clinics for clinical and academic staff

- 'Making Sense of Evidence' workshops covering introduction to research, searching, critical appraisal skills of trials, systematic review, diagnostic and qualitative studies (163 NHS based delegates including doctors, physiotherapists, OTs, research nurses, paramedics and ten PenPIG members). £10,000 matched funding from Health Education South West (HESW) was awarded to ensure free workshop places for AHPs and nurses

- Modelling workshops covering Foundation level, Introduction to modelling, and Geographical modelling (13 workshops with 154 delegates)

- Cognitive interviewing course (March 2015)

- STATA training (22 academic staff)

- CPD courses with matched funding from HESW targeting AHPs and nurses on statistics, health economics and systematic reviews

- Tutor training in Evidence-Based Practice. We have a long running programme of tutor training to promote spread and sustainability of this activity. In the current period a further three people have attended the Oxford 'Teaching evidence-based practice' course and joined our 'Making Sense of Evidence' tutor team

- Our PPI team has provided bespoke training sessions including research training sessions for the general public (searching skills, systematic reviews) and '*Miracle cures and health scares'* workshops targeting college students, ex-offenders and University of the 3rd Age members.

Engagement in research
We actively encourage question submitters to stay involved with projects that are prioritised for further investigation. Virtually all projects include involvement of clinicians and members of the public. This includes grant applications on which members of the public have been applicants. We are committed to providing appropriate training, both formal and informal, for all those who work with us.

6. Links with NIHR Infrastructure

We collaborate extensively with other parts of the NIHR infrastructure, with other NIHR-supported organisations, and with other partners. There is close collaboration between all 13 CLAHRCs. Directors and Programme Managers meet regularly, a link coordinated by a jointly funded Partnership Programme based at Universities UK, and a number of cross-CLAHRC groups with common methodological or subject interests have been formed. These include PPI, Operational Research Modelling, Economics, Stroke and Mental Health Groups in which our staff are active participants. At a project level, we have active collaborations with CLAHRC West (Paediatric Admissions project), CLAHRC South London (Interface2), CLAHRC Wessex (DeCoDeR), CLAHRC West Midlands (Polypharmacy), and CLAHRC North West Coast (DeCoDeR and Polypharmacy).

Local collaborations with NIHR infrastructure include:

- **NIHR Exeter Clinical Research Facility.** Shared standard operating procedures, joint training, and collaboration between methodologists

- **NIHR Clinical Research Network (CRN): Southwest Peninsula.** Ten current projects (all with additional external grant support) are currently being supported by the CRN. The CRN provides training for staff and for our new cohort of PhD students. Along with the AHSN we are supporting the “Drive” project, which aims to further streamline the process for study approval and opening which is being led by the CRN

- **NIHR Research Design Service (RDS) Southwest.** 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 some of our projects. We also have an agreement whereby research questions which are unsuitable for PenCLAHRC to take forward are passed on to the RDS

- **Peninsula Clinical Trials Unit (PenCTU).** This unit is supported by an NIHR Clinical Trials infrastructure grant. All substantial clinical trials run within the PenCLAHRC portfolio involve collaboration with PenCTU.

7. Links with Industry

7.1 Engagement strategy
Our strategy in relation to industrial partners is based on capitalising on opportunities where engagement activities have led to the combination of promising interventions, willing partners, and cross-sectoral research potential. This yielded a number of promising partnerships during the pilot CLAHRC, some of which continue, but the potential for us to develop a more comprehensive programme has been boosted by our close relationship with the SW Academic Health Science Network. The AHSN has a Commercial Advisory Board that is developing a joint collaborative work programme with industry with which we will link to identify and exploit opportunities.

A number of joint PenCLAHRC/industry partnerships have been established in the software development sector. We are involved in the development of active websites (e.g. the NetMums project with Shake Creative

and the TeenTEXT project with Neontribe) as well as software apps (e.g. AF-APP for the diagnosis of atrial fibrillation with US collaborators and an app to support Meniere's disease with Buzz Interactive in Cornwall). Also in the field of software and informatics, our collaboration with Lightfoot Solutions Ltd. continues, and gives us valuable (>£100,000) access to their software platform, which allows rapid manipulation of routine NHS data. We have recently also made progress in developing a partnership with Simul8, manufacturers of simulation software, to support our growing capacity development work in operational research.

7.2 UK Small and Medium Enterprises (SMEs)

Our collaborations with SMEs have increased over the past year and 31 partnerships are now active. The European Centre for the Environment and Human Health, a part of the CLAHRC, is particularly active in this field developing and has developed close collaborations with SMEs in Cornwall. The HeLP obesity prevention project collaborates with 6 SMEs in the South West including Headbangers Theatre Company, the Eden Project, and Plymouth Raiders basketball team. The Discover project, which is developing an approach to dynamic splinting to reduce pain and improve function, confidence, and wellbeing in people with osteoporotic vertebral fractures is the product of a collaboration with DM Orthotics, a Cornwall-based SME orthosis manufacturer.

The ReTrain project – the development of a rehabilitation intervention for long-term stroke survivors – has built on a continuing collaboration with the ARNI Institute, an SME based in Surrey. Evaluation of ReTrain is now being supported by the Stroke Association. The STARs study (Supporting Teachers and Children in Schools) represents a collaboration with Babcock LDP, Exeter Community Initiative (ECI – a third sector umbrella organisation), and the Incredible Years Programme (based in the USA). The study is applying and evaluating the Incredible Years intervention for teachers and contributing to its further development.

The production of an app to enable the diagnosis of atrial fibrillation (AF) has involved significant collaboration between PenCLAHRC and US scientists, Worcester Polytechnic Institute, South West AHSN, and South Devon & Torbay CCG in the context of a Technology Transfer and Licence Agreement. Also in the field of software development, we are collaborating with Shake Creative to develop a website as part of the NetMUMs intervention, with copyright held by the University of Exeter. An evaluation of this initiative will be submitted for NIHR funding later in 2015.

7.3 Strategic partnerships with industry

In addition to the partnerships identified above, we are developing collaborations with care home providers. Care Homes are a key setting for the provision of community health care and present a range of opportunities work across many of our themes although challenging to engage with as a sector despite some positive national initiatives such as EnRiCH. We are at the early stages of these collaborations, building on a range of existing PenCLAHRC work relevant to care provision (e.g. reviews of dementia gardens, antipsychotic prescribing, and mealtime management).

The Pengage Project, which has developed a range of educational materials to depict aspects of evidence in an innovative way to promote understanding and make learning about evidence-based practice fun, has engaged with the Eden Project over the past year. The project has links with a wide range of organisations including Cornwall Neighbourhoods for Change, West Cornwall Healthwatch, Healthwatch Cornwall, Healthwatch Devon, and Cornwall Rural Community Council. Over the next year we will explore the potential to exploit the intellectual property created in this project.

7.4 Agreements with industry

We have created a spin-off company - C2ltd - who will deliver the implementation arm of Connecting Communities (C2), a PenCLAHRC-supported research project. The C2 project has engaged a wide range of community and third sector organisations to affect transformational change, building on lessons from flagship regeneration initiatives in Cornwall. The support materials, C2 handbook, case studies and data capture forms have been copyrighted and a licence to deliver C2 is being created. Six new commissions to implement this programme have been won by C2ltd.

The AF-APP project is working within a license agreement alongside the Worcester Polytechnic Institute, South West AHSN, and South Devon & Torbay CCG. The Plymouth University Primary Care Group, which receives substantial PenCLAHRC support, signed a non-disclosure agreement with Catch22 related to the further implementation of the Engager model of care for prison leavers with common mental health problems.

8. Matched Funding

Matched funding for PenCLAHRC comes from multiple sources including the two Universities, the AHSN, NHS organisations, Cerebra (a family-based charity for children with neurodevelopmental problems), and the private sector. The activities supported by this funding are largely dependent on the source although some funds such as those from the universities have fewer restrictions on how they can be used. At the other end of the spectrum, funding from Cerebra can only be used for projects related to children with neurodisabilities and their families. Matched funding underpins work across all PenCLAHRC activities and only a few examples can be highlighted in this section.

Our largest source of matched funding is from the universities. University funding supports research activities across all themes and this work frequently has direct impact on services. For instance, the work produced by Prof Willie Hamilton's group (*Diagnostics Theme*), supported by separate NIHR grants, directly by PenCLAHRC, and by matched funds from the University of Exeter, has been extremely important in the recent production of the new NICE Guidance on the investigation of suspected cancer, many of whose recommendations depend directly on research led by this group.

Funding from the AHSN and NHS organisations is primarily directed towards implementation or in some cases the production or synthesis of evidence to make service change possible. A number of projects with supported funding from these streams are discussed elsewhere in the report (see *Added Value Examples*). An example of evidence-based implementation is the use of operational research modelling as a tool to improve the management of acute stroke care (*Evidence for Policy and Practice Theme*). This builds on a project initiated in the pilot CLAHRC that led to a doubling in the proportion of stroke patients receiving appropriate thrombolytic treatment in one Trust. New support from the AHSN and SCN is helping us extend this project to all trusts within the South West. As a research organisation PenCLAHRC is well placed to synthesise and contextualise evidence for implementation and with the same partners we are studying how best to implement the use of high-sensitivity troponin for the diagnosis of acute chest pain.

Cerebra funding underpins the work of PenCRU, the Peninsula Childhood Disability Research Unit (*Evidence for Policy and Practice* and *Person-Centred Care Themes*). The PenCRU Family Faculty comprises around 300 families of disabled children who participate as partners in all aspects of research including prioritisation, study design, study conduct and dissemination. In addition to research and training, the unit works with the charity to produce summaries of evidence ("What's the Evidence" http://www.pencru.org/evidence/) in response to questions raised by parents. These summaries are written in plain English with the help of the Family Faculty. They are aimed at families but are also widely used by professionals working with disabled children.

9. Forward Look

Close engagement with decision makers to identify and attempt to resolve key uncertainties will remain at the heart of our strategy. This approach will continue to produce new research studies and opportunities to improve health through better use of evidence. The following are examples of projects that grew from this process in the pilot CLAHRC which will come to fruition during the next year:

HeLP is a large cluster randomised obesity prevention trial in schools which is funded by the NIHR PHR programme but grew from a question submitted to PenCLAHRC and is testing an intervention developed

within PenCLAHRC. The trial has been extremely successful with retention rates above 95% and has demonstrated success in engaging children and families. The results are anticipated in early 2016 and are likely to attract considerable attention.

Three programmes of evidence-based service change - acute stroke care, patient initiated outpatients clinics and acute paediatric care – are expanding from their original evaluation in single centres to further centres across all acute partners for the first two and through the entire Southwest for the paediatric acute care project. Early results from all three are likely to be available during the next year.

Because partnership with providers and commissioners lies at the heart of our strategy to achieve impact we recognise that the next year is likely to bring significant challenges and some opportunities. NHS services are under financial pressure which can hinder attempts to use evidence to produce service changes which may require short term investment to produce longer term benefit, particularly in the realm of preventive interventions. It may though engender a willingness to consider more radical approaches to service delivery such that organisations will be receptive to work currently underway in the CLAHRC around integration of services, changes to delivery of outpatient services and more patient led approaches. We believe that restructuring of organisations such as the SCNs and AHSNs is under active consideration by NHS(E) and this will require a rebuilding of important relationships for implementation. In addition, increasing involvement of private and 3rd sector organisations in service delivery will also require us to flex our current modes of working. All of these changes are likely to put further pressure on the need to adapt research timescales to the urgent needs of NHS services for answers.

We have in the last year developed an excellent working relationship with the AHSN. This organisation has an explicit mission to "identify and spread the adoption of innovation and best practice", a mission to which the NIHR CLAHRC can make a major contribution. We have established a number of joint projects with the AHSN which bring together the CLAHRC skills in the generation and synthesis of evidence with the AHSN's links into both commissioning and delivery of service, to offer the opportunity to help us to scale up the impact of our research. These projects also offer a "substrate" for research in implementation science. We see a particularly important role for PenCHORD, our rapidly expanding operational research modelling group. Their work has already had a significant effect on using research to help drive service change and has had an enthusiastic reception from the AHSN and NHS partners. Not only can these projects have a direct impact but a focus on capacity building in partner organisations provides significant benefits and a motivation for these partners to engage.

We believe that the progress against our key objectives that we have documented in this report, vindicates our original approach and we aim to continue to build on this foundation. The challenge facing us now is how to most effectively ensure the continuation of this success in a rapidly changing NHS context, changes which pose considerable challenges but also offer significant opportunities.