Institution: University of Southampton

Unit of Assessment: 02 Public health, health services and primary care

1. UNIT CONTEXT AND STRUCTURE, RESEARCH AND IMPACT STRATEGY

1.1 CONTEXT

The Primary Care Research Centre (**PCRC**), part of the School of Primary Care, Population Sciences and Medical Education (**PPM**), within the Faculty of Medicine, provides an energetic, productive and nurturing research environment. *We aim to produce world-leading research, informed by patient and public involvement (**PPI**), working with health professionals and policy makers and developing research students, to strengthen primary care practice and improve patient outcomes.* PCRC has increased in size, productivity, and influence since 2014, with sufficient critical mass to submit 18 (13.56FTE) academic staff compared to 13 (10.50FTE) in REF2014: a 29% FTE increase.

1.2 STRUCTURE

Faculty academic staff are organised into PPM and three other research-led Academic Schools:

- Clinical Experimental Sciences (**CES**)
- Human Development and Health (**HDH**)
- Cancer Sciences (**CS**)

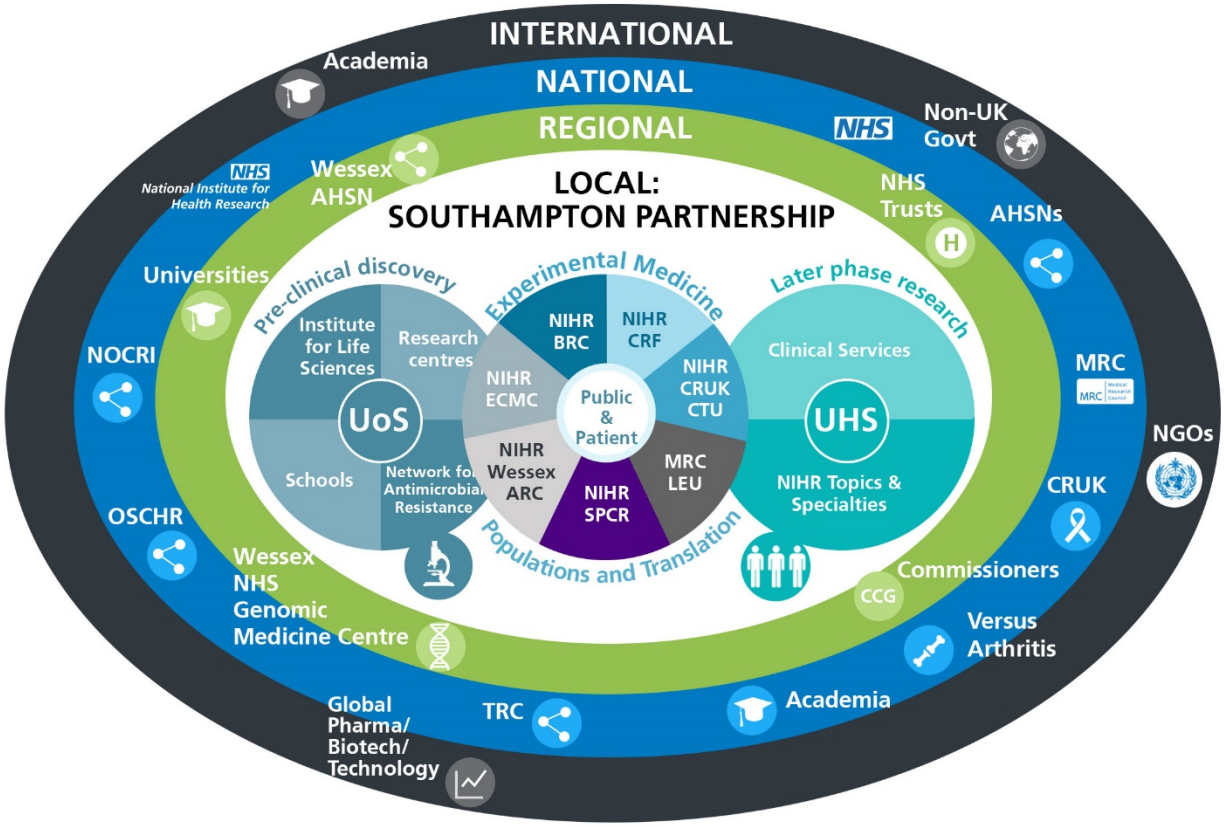
Four other research centres are fully integrated with the Faculty and its strategy, all based at the University Hospitals Southampton (**UHS**) main site (see diagram below):

- MRC Lifecourse Epidemiology Unit (**LEU**)
- NIHR CRUK Southampton Experimental Cancer Medicine Centre (**ECMC**)
- NIHR Biomedical Research Centre (**BRC**)
- NIHR Southampton Clinical Research Facility (**CRF**)

The Faculty will celebrate its 50th Anniversary in 2022 and has made a substantial impact across areas of research strength in basic discovery as well as population sciences. The Faculty employs 453 academic staff including 94 professors, 61 associate professors and 35 lecturers. Annual research income in 2019/20 was £34.9M, having grown by £8.5M since 2013. The Faculty is led by the Dean, Professor Diana Eccles.

The vision of the Faculty is *to lead innovative learning and discovery for better health across the life-course.* We have invested in multidisciplinary research teams, creative educational programmes, translational research programmes, clinical infrastructure and enterprise to deliver on this vision. Faculty strategy involves a close partnership with UHS, governed by the Joint Research Strategy Board (**JRSB**), jointly chaired by the Dean and Trust Chief Executive. The JRSB leads on strategy, policy and finance related to translational and clinical research across the University and UHS partnership (see diagram below).

The Faculty Operating Board (**FOB**) meets bi-monthly and comprises the Dean, Heads of Schools; Associate Deans for Research, Education, Enterprise, and Internationalisation; Finance Officer; and Faculty Operating Officer.



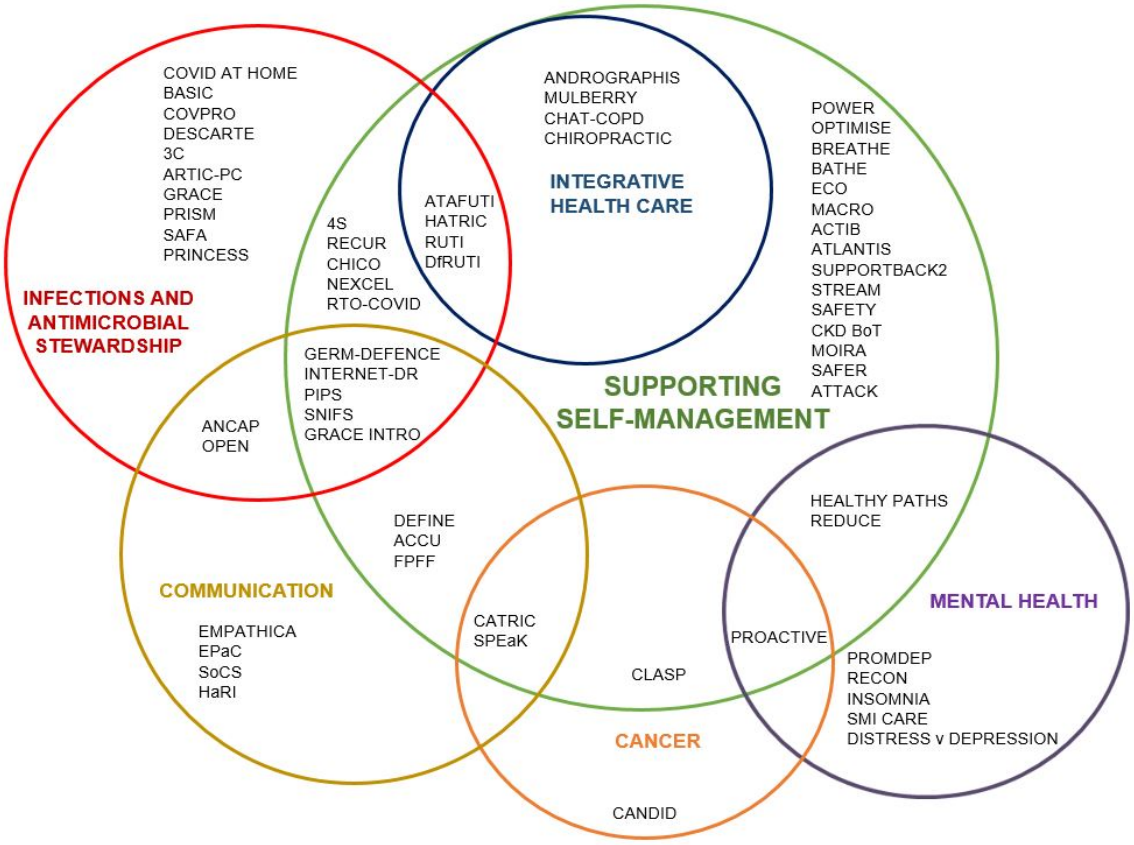
UoS:	University of Southampton
NIHR ECMC:	NIHR Experimental Cancer Medicine Centres
NIHR Wessex ARC:	NIHR Applied Research Collaboration Wessex
NIHR SPCR:	NIHR SPCR Primary Care Research Centre
MRC LEU:	MRC Lifecourse Epidemiology Unit
NIHR CRUK CTU:	NIHR Cancer Research UK Clinical Trials Unit
UHS:	University Hospital Southampton

PPM has a single management structure with regular Executive meetings and termly all-staff awaydays, to consider policy, strategy, and research oversight. PCRC is the largest group in PPM, which also contains a Public Health group (UoA1), Medical Education group, and NIHR Research Design Service (**RDS**) South Central. PCRC has 9 senior staff (7 professors, 2 associate professors), plus 3 clinical lecturers (CL), 16 other postdoctoral researchers, 13 doctoral students, and 32 research staff.

1.3 RESEARCH STRATEGY

Since 2014 our strategy has built on our existing strengths in **six overlapping themes**: *infections and antimicrobial stewardship; mental health; supporting self-management; integrative health care; cancer; and communication*, acknowledged in REF2014 and recognised through continuing inclusion (since 2009) in the National Institute for Health Research (NIHR) School for Primary Care Research **(SPCR)**, one of only nine departments nationally.

The diagram below shows that our six research themes overlap, and that ***Supporting Self-Management*** has been our key theme, covering two-thirds of the studies conducted within the period (42 of 64).



Primary Care Research Themes and Studies

We have made significant progress in all nine objectives covering the assessment period:

1. Remain a vibrant research group within the NIHR SPCR with critical mass and national and international prominence:
After doubling in size from 2008-2013, we have grown further, ensuring critical mass with succession planning through promotions and new appointments (§3.3). Between 2014 and 2020 we produced ***926 publications***. Of 686 (74%) listed in SCOPUS (2020), 25% were in the top 10th centile for citations, (field-weighted citation index 2.0, twice the mean of 1.0), and 37% had international collaborators as co-authors (also high for primary care).

2. Continue to develop stronger links within the Faculty of Medicine:
We have expanded collaborations within the core nutrition and respiratory themes of the NIHR BRC (§4.1).

3. Build on our research peaks to develop new areas of research with new staff:
Since 2014 we recruited a new professor, three new GP CLs and a Chiropractic Research Council funded senior research fellow (SRF), who are actively developing a wider range of new research (§3.3).

4. Strengthen our methodological expertise and support:
We work with health economists **Raftery** and **Lord**, and still with **Yao** following her move to a Chair at Leicester. We work with statisticians **Stuart** and **Harris** as well as Reading, Griffiths and Böhning (UoA1) in the RDS, NIHR CRUK Clinical Trials Unit (**CTU**), and Southampton Statistical Sciences Institute (**S3RI**) respectively. **Stuart** has a joint post with the CTU.

PPI contributors now play a central role at all stages of the research process. We engage with patients, charities, service user groups and communities, reaching out to people who are under-represented, with unmet health research needs. We are embedding UK PPI standards including contributions to research governance and strategy, developing learning opportunities for contributors and researchers working together towards excellence in PPI and engagement.

5. Further develop our doctoral students and early career researchers (ECRs):
Since 2014 we were awarded 6 NIHR, 1 Wellcome, and 2 Chiropractor Association doctoral fellowships; 2 SPCR postdoctoral fellowships, 4 Academic Foundation Posts (AFPs); 5 NIHR Academic Clinical Fellowships (ACFs); 2 GP In-Practice Fellowships (IPFs); and 3 CLs. We have enlarged our Research Education Advice and Communication in Health (REACH) ECR development forum, and fund student and researcher conference attendance (§3.3).

6. Utilise routinely collected data to answer important research questions:
We developed expertise in database support and statistical analysis of large databases including the Clinical Practice Research datalink (CPRD) and Hampshire Care and Health Information Exchange (CHIE, §3.2).

7. Contribute to the implementation of research findings in primary care:
We were active partners with Health Sciences (UoA3) in the Centre for Leadership in Applied Health Research and Care (CLAHRC), leading on reducing antibiotic prescribing (**Moore**), preventing acute kidney injury (**Moore, Fraser),** and evaluating community-based respiratory services (**Thomas** with Wilkinson (UoA1) in CES). We work closely with the new NIHR Applied Research Collaboration for Wessex (**ARC**, §1.4).

8. Consolidate our strategy of working with major external partners:
We play leading roles developing projects with EU collaborators (**Little** with Verheij in Utrecht and Bucher in Basel), the Oslo Antibiotic Centre for Primary Care (**Francis**), Centre for Evidence-Based Chinese Medicine at Beijing University of Chinese Medicine **(Moore, Willcox)** and Mbarara University of Science and Technology in Uganda **(Willcox)**. We work closely with charitable funders including Asthma Research UK (**Thomas**) and Macmillan (**Leydon**) (§4.1)

9. Respond to national and international priorities and initiatives:
We have responded to initiatives led by the NIHR and Royal College of General Practitioners (RCGP) strategic groups, boards and panels to develop new areas of research, e.g. the RECON programme on preventing dementia, and antimicrobial stewardship research calls.

1.4 IMPACT STRATEGY

Nationally and internationally, we work with patients, policy makers, commissioners, and providers, e.g. on several guideline committees for NICE, and have had direct impacts on government health policy, and national and international health guidelines and reports (§4.1).

Our major trials and cohorts have demonstrated reductions in antibiotic use in respiratory tract infections using delayed antibiotic prescriptions, a clinical score for pharyngitis (FeverPAIN), communication-skills training, measuring C-Reactive-Protein; and a digital intervention to support handwashing, which has developed a national profile as part of the strategy to tackle COVID-19 (*Germ Defence*). Delayed antibiotic prescribing (see **Impact Case Study ICS02-01**) is now used in everyday practice nationally and internationally, through inclusion in nine national and four international guidelines; FeverPAIN website use >200,000 times annually; the Chief Medical Officer's 2015 national delayed prescribing initiative; and our communication-skills modules used internationally (**Little, Moore, Francis**).

We have delivered evidence to inform NICE guidelines and clinical performance indicators in the national GP contract quality and outcomes framework (QOF) for the assessment of depression, and regular health checks for people with psychosis (**Kendrick**, **Moore**).

Little and **Geraghty** worked with local authorities and clinical commissioning groups in Hampshire, Lancashire, and the Black Country to disseminate POWeR, our digital intervention for obesity (**ICS02-02**), and the Wessex Academic Health Science Network (**AHSN**) on infection control, back pain, and distress. **Little** and **Everitt** contributed to the highly-cited SPCR study '*From Evidence to Practice: Addressing the second translational gap for complex interventions in primary care*'. We work actively with the Wessex ARC leaders Richardson (Director, UoA3), Roberts (Ageing and Dementia lead), Parkes (Healthy Communities lead) (both UoA1), and **Fraser** on Long-term Conditions (**Little, Everitt, Santer, Kendrick**).

All new academic staff are inducted into our communication strategy and our REACH group supports ECRs in dissemination, as well as research conduct. Our doctoral students attend courses in: Engaging audiences from the stage; Exploring enterprise and self-employment; Open-Access publication; and PPI, including communicating research to public audiences ('*Science busking*'; and '*Meet the Scientist*').

PCRC staff engage with regional events run by the University's Public Engagement with Research, and Public Policy Southampton units (REF5a§2.9), and work with the University's Strategic Enterprise Board through the Faculty's Associate Dean for Enterprise. PPM is a founding member of the Wessex Public Involvement Network (PIN); a collaboration of staff and PPI contributors in nine NIHR organisations.

Senior staff present recent research at annual national (Society for Academic Primary Care (SAPC), RCGP, SPCR), and international conferences (North American Primary Care Research Group (NAPCRG), Clinical Consensus conferences on ENT, General Practice Research on Infections Network, and Paediatrics).

We liaise closely with the Faculty's press office to ensure impact in local and national media, and have a quarterly School newsletter, corridor boards which celebrate impact, and externally facing PCRC website and Twitter accounts with active news feeds.

1.5 FUTURE STRATEGY

Developed to align with national priorities, and designed to facilitate cross-fertilisation and synergy, our four major, overlapping, themes going forward from August 2020 will be:

- **Supporting self-management** addressing increasing needs for self-management of infections, including new viruses, non-communicable long-term conditions, and disability, for an ageing population facing increasing multimorbidity, frailty, and polypharmacy. It builds on our close links with Psychology and international reputation for developing and evaluating digital interventions.
- **Improving use of medicines** including database and observational studies describing medicine use and associated outcomes, qualitative studies of patient and prescriber perspectives, and trials evaluating effectiveness of medicines and optimal use (including deprescribing where appropriate).
- **Healthcare communication** seeking to improve patient outcomes by optimising healthcare interactions, including developing tools to enhance empathy and positive messages, evaluating agenda-setting within consultations, and detailed conversation analysis of video- and audio-recorded consultations to improve communication.

- **Diagnosis and prognosis** including prospective observational studies, routine data studies, qualitative studies, diagnostic studies and randomised trials to improve the management of common conditions in primary care. Ongoing studies focus on diagnosis and prognosis of COVID-19, sore throat, urinary tract infection (UTI), asthma and chronic obstructive pulmonary disease (COPD), mental health problems, atrial fibrillation (AF), and cancer.

Cross cutting these themes will be our main clinical areas of:

- **Infections and antibiotic stewardship**
- **Long-term conditions** (respiratory; mental health; skin; gastrointestinal; musculoskeletal; cancer; cardiovascular etc.)
- **Healthy ageing**
- **Integrative health care**

Key **objectives** going forward include:

1. **Completing ongoing research** for COVID-19, and non-COVID-19 studies.
2. **Increasing funding** through increasing the size and number of high-quality applications.
3. **Strengthening senior leadership** through external appointments and internal promotions to replace senior staff due to retire, ensuring the long-term sustainability of the Centre.
4. **Increasing capacity** by recruiting to PhD studentships, NIHR ACF and CL posts, and mid- and senior-grade posts.
5. **Further developing our links within the Faculty of Medicine** working with the BRC on diagnosis, prognosis and treatment of COPD, asthma and respiratory infection, under-nutrition in the elderly, and obesity.
6. **Building on collaborations with the ARC, Health Sciences and Health Psychology**, in particular on antibiotics, common skin problems, insomnia, cancer, and fatigue.
7. **Further developing large database expertise** (CPRD and CHIE).
8. **Developing existing and new collaborations with charitable funders and industry.**
9. **Continuing to develop our PPI** with our dedicated lead and the Wessex PIN, building sustainable relationships with existing and new public contributors and community groups, maximising support and training for researchers and contributors, including peer mentorship.
10. **Implementing research findings** through engagement with the ARC, AHSN, NICE, national and international guideline groups, health professional groups, charities and wider public and media.

1.6 RESEARCH INTEGRITY

The Faculty is active in maintaining and advancing a culture of research integrity and ethics in accordance with the *Concordat for Research Integrity* (see REF5a§2.8). Health research has to meet the ethical, legal and professional standards of the Declaration of Helsinki; the Health Research Authority; NHS Research Ethics Committees; internal Faculty Ethics Committee; and journal requirements to declare conflicts of interest and sufficient contributions of authors to justify authorship of publications. PCRC researchers Vennik and Eyles have served on the Faculty Ethics Committee. PPM actively promotes research integrity through internal peer review of all study protocols for importance, feasibility and ethics, before external submission for funding. We work in teams where data entry and analysis are shared, and any issues relating to the probity of data would be immediately apparent. All research staff have periodic training in the

2018 General Data Protection Regulation guidelines and report any breaches of these. New doctoral students complete a data management plan at the start of their studies, to ensure that they are aware of good practice, and regularly discuss their data collection with their supervisory panels.

1.7 OPEN-ACCESS (OA) AND DATA SHARING

We actively promote a culture of OA, nationally through membership of the SPCR, SAPC and RCGP, and internationally through NAPCRG. Our researchers take advantage of University-wide resources, including *ePrints*, its online repository, *PURE*, its research information system, and OA deals with publishers. PPM recognises the benefit to public health through sharing research openly, and support in understanding individual funder requirements is provided to ensure there is provision for paying fees throughout the project.

Seven senior PCRC members belong to editorial teams for OA journals (§4.3) and contribute to national and international discussions and decision-making relating to different publishing models, policies and strategies for supporting OA.

We produce explicit written policies on data-sharing for all new projects and programmes, agreed between co-applicants. We usually make anonymised quantitative data available to outside researchers, subject to the receipt of a specific peer-reviewed proposal for further analyses. We share the detailed findings of qualitative analyses but not the original qualitative data, which are prone to risks of identifying participants. The University meets the Wellcome statement requirements on sharing research on COVID-19.

1.8 INTERDISCIPLINARY RESEARCH

Our research usually involves collaboration with a range of disciplines within the Faculty and wider University. In particular we carry out interdisciplinary research with Health Psychology (UoA4) and Electronics and Computing Sciences (**ECS**, UoA11), to develop and evaluate our digital interventions (§4.1). Interdisciplinary research with ECS includes **Little** and Byrne (UoA1)'s trial of a successful web-based behavioural intervention for obesity (POWeR, **ICS02-02**), and an integrated obesity and alcohol intervention (with **Moore)**. **Little** is collaborating with Stroud (UoA1) in the BRC on STREAM, and with Barker at the MRC LEU on the NIHR EACHB programme providing digital lifestyle change support for adolescents.

2. PEOPLE

2.1 STAFFING AND RECRUITMENT POLICY

Our staffing strategy aims to build on our research peaks to develop new areas with new staff (§1.3), explicitly considering how new appointments and fellowship applications relate to existing themes or might lead to new ones. Fundamental considerations for supporting new researchers are the potential to increase the evidence base for improved primary care practice, impact on patient outcomes, and population health gain. For example **Santer**, recruited as a CL, now Associate Professor, brought an interest in dermatology, a new clinical topic, and developed internet interventions, strengthening our *self-management* theme.

We have been succession planning for staff approaching retirement through both recruitment and internal promotion. Since 2014 we recruited a new professor (**Francis**), three new GP CLs (**Lown, Willcox** and **Dambha-Miller**) and Chiropractic Research Council funded SRF **Newell**. CLs **Everitt** and **Santer** and SRFs **Stuart** and **Geraghty** were promoted to Associate Professor; and **Moore**, **Leydon** and **Everitt** were promoted to professor.

Francis has strengthened our antimicrobial research, particularly in respiratory infections including the COVPRO COVID-19 community management prognostic study, and leading the COVID-19 community trial of inhaled interferon-beta. **Santer** developed dermatology research with Nottingham and Bristol, including the HTA BEE, ECO, BATHE, and SAFA trials, SPCR TEST study of allergy testing in eczema, and SPCR Cellulitis experience survey. **Lown** led the SPCR SAFETY trial of screening for AF, co-leads the SPCR PROBITY study of obesity related to long-term antibiotics in earlier life, was local PI for the OPTIMISE blood pressure medication reduction trial, and is working with Cambridge on a research programme on AF screening. **Willcox** is involved in clinical evaluation of rapid RNA and antibody tests for COVID-19, an international survey on COVID-19 prevention and treatment, and developing global health initiatives including the AHRC-MRC funded "Family planning: fact or fiction?" and "Antenatal Couples' Counselling" projects in Uganda, and ANTRUK charity-funded study to reduce antibiotics for diarrhoea in China. **Geraghty** led the SupportBack feasibility trial, now a full HTA trial. **Stuart** is co-PI on a Bristol-led MRC grant on reducing inappropriate antibiotic use in China. **Newell** is evaluating chiropractic practice within NHS Pathways for low back pain with **Moore**. **Dambha-Miller** works on the SPCR Empathica study to improve expectations in osteoarthritis consultations; and empathy in diabetes care.

2.2 EQUALITY, DIVERSITY, AND INCLUSION (EDI)

All PPM staff who take part in interviews for staff appointments, fellowships, and studentships must undergo the University on-line EDI training and update it every three years. The overall demographic profile of PPM staff has changed from 2014 to 2020, with increases in women from 62% to 72%, in BAME staff from 11% to 16%, and in staff declaring a disability from 2% to 6%.

EDI leads **Stuart** and Alwan (UoA1) have been active members of the Faculty EDI Committee which promotes equality, well-being and engagement for both its staff and students. They regularly consult with staff to identify EDI objectives, and are supported in delivering them by the central University's EDI Team. EDI is a standing item at FOB and PPM Executive meetings.

The Faculty was awarded an Athena SWAN Silver Award in 2015 and aspires to a Gold Award. Our Athena Swan Silver action plan has been implemented and we have worked to embed the Athena SWAN processes across our organisational structures. This has led to a greater awareness of core hours (10am-4pm) and developing email signatures encouraging others not to respond outside working hours.

Alwan is the Faculty's Intersectionality Champion and led a facilitated peer-support group activity for women from ethnic minorities (staff and students) aimed at career progression. She is also leading a new cross-institutional Intersectionality Mentoring Scheme to match mentors with mentees from a minority background across UK medical schools.

A culture of inclusivity is fostered through PPM awaydays and monthly coffee mornings. **Stuart** and two other staff members have qualified as Mental Health First Aiders to assist with staff and student mental health concerns. We encourage effective annual appraisal to ensure that staff are supported, and opportunities for mentorship, training and promotion are identified. In 2019-2020, 100% of PPM academic staff had an appraisal.

Full regard to EDI issues has been paid while constructing our submission. All senior staff have had the opportunity to input to this REF5b and we have followed Southampton's REF Code of Practice in our submission (REF5a§3.9).

2.3 STAFF SUPPORT AND DEVELOPMENT

Short and long-term contracts

We uphold the Concordat to Support the Career Development of Researchers and move ECRs to permanent contracts after working in the University for four years. Between 2014 and 2020 the number of staff on permanent contracts in PPM increased from 14 to 21. When a contract has less than six months left, meetings with the supervisor are obliged to plan transition to a new contract where possible. Research leave is offered including a semester's sabbatical every seven years for senior academics, and study leave for clinical academic staff.

Flexible working

Flexible working is encouraged and since 2014, 43 members of staff within PPM were granted a change to working patterns. Staff policies apply equally to full-time and part-time staff, and within PPM no distinction is made between them in allocation of resources.

Early career researchers

The University's Centre for Higher Education Practice supports ECRs through training and networking events. The Faculty Postdoctoral Association (PDA) actively supports our 19 post-doctoral staff, ensuring we align with the Research Concordat, and provides Dean's Awards for postdoctoral staff, and for 'most supportive PI', as well as a Christmas Lecture, and other events.

The REACH forum, led by the ECRs themselves, meets six times a year to present research ideas and findings and discuss issues of common concern, and is represented on the PPM Executive. Senior PPM academics also provide individual mentorship, complementing the Faculty scheme. **Everitt** is responsible for postgraduate development within PPM, in liaison with the SPCR.

We internally peer review ECR fellowship applications, and mock interview panels are run by the RDS, led by **Little** and **Kendrick**. Since 2014 they have helped secure 8 doctoral fellowships (6 NIHR SPCR-funded, and 2 Chiropractor Association), 2 SPCR postdoctoral Launching Fellowships, and 2 NIHR GP IPFs.

Mentoring, probation, appraisal and training

All new research staff undergo probation, with regular supervision meetings with specific objectives set for the first six months, a written personal development plan, and review at 3- and 6-month follow-ups. In addition to the Faculty mentoring scheme, ECRs and senior researchers are encouraged to seek discipline-specific mentoring outside the University where appropriate, through the SPCR, SAPC, or other networks.

Staff recognition and rewards

Staff are eligible for Faculty "Shine a Light" Awards made every quarter under the categories of Quality, Creativity, Collegiality and Efficiency. The Dean's annual Postdoctoral Awards are for Education, Citizenship, Public Engagement, and Enterprise. The Vice-Chancellor awards annual prizes for Administrative and Operational Efficiency, Career Achievement, Collegiality, Early Career Research, EDI, International Engagement, Mentoring, Public Engagement and Outreach, Research Impact, Student Experience, Service to the University, and Teaching. PPM staff have won awards for efficiency (Cousins), enterprise (Hu), and showing initiative in research (Hunt).

Supporting wellbeing

The University provides a diverse programme of social, cultural and recreational activities and resources to promote wellbeing and self-awareness of issues affecting staff and students (REF5a§3.4). The Employee Assistance Programme provides free 24/7 confidential advice and

support on-line or by telephone on a wide variety of issues, including relationships and families, childcare support, financial wellbeing, bereavement and loss, and emotional health. Factsheets, 4-week programmes, and literature are provided on stress, anxiety, depression and mindfulness, with quick links to information on NHS and voluntary sector counselling and therapy.

The University has a supportive policy for managing ill-health, including guidance for return to work, and maintaining contact during prolonged absences. Allowances are made in terms of workload and timetabling in discussion with line managers and HR Business Partners, and a Parents and Carers network provides peer and professional support. All PPM staff meet with their supervisors after periods of sick leave, to ensure they are well enough to return to work, and that any necessary adjustments are made to their working environment to accommodate their problems, with referral to Occupational Health for support where appropriate.

2.4 RESEARCH STUDENTS

From 2013-14 to 2019-2020, 15.90 full-person-equivalent (FPE) doctoral degrees co-supervised by UoA2 staff were awarded (compared to 8.05FPE over 5 years in REF2014). Nine students with lead supervisors in the group graduated (up from 7 in REF2014), of whom four went on to postdoctoral research. Currently we have 13 PPM doctoral students registered in the Faculty, all jointly supervised by two or more academics. In addition we have 20 students jointly supervised, but registered with other groups (mainly Health Psychology and Health Sciences), arising from our extensive collaborations.

We have worked to increase our student numbers through:

- Membership of the SPCR, giving access to annually awarded non-clinical PhD studentships;
- Funding studentships from PPM reserves, on the back of project and programme grants;
- Being one of four departments nationally to be awarded Wellcome-funded Clinical PhD fellowships for GP doctorates;
- Ensuring all investigators undergo EDI and supervisor training to maximise capacity;
- The ADR's programme of workshops and individual support for applications for external fellowships including mock interviews;
- Recruiting graduates of our Masters programmes in Statistics, Public Health, and Psychology;
- Building on our links with Utrecht, Basel, Amsterdam, Oslo, Beijing and Uganda, and the International Primary Care Respiratory Group, to attract overseas students;
- Joint PhD studentships with the Anglo-European Chiropractic College through **Newell**;
- **Everitt** exploring enhancement of recruitment through the SPCR postgraduate group.

Monitoring and support of doctoral students, skills development

Our doctoral students undertake individualised learning needs analyses within a month of enrolment, and agree tailored training and an annual formal assessment with an adviser outside the supervisory team. PPM provides funding for training and conference attendance (§3.3) and holds a very successful annual PhD presentation conference.

Students receive training and support in PPI, and access to Faculty generic research methods training and pastoral support through programmes run by the Graduate School and Southampton Clinical Academic Training Scheme. The Graduate School programme includes:

Learning Needs Analysis; Study design; Epidemiology; Library and critical appraisal skills; Statistics; Presentations; and Ethics and Governance. Specific skills training includes: Endnote; E-theses; Qualitative analysis; Statistical Programming in R; NVivo; Bibliometrics; Literature searching; Systematic review methodology; Data management: and Word: creating a Thesis.

Students are directed to training courses appropriate to their specific needs in Southampton or elsewhere, e.g. qualitative methods in Health Sciences; Courses in Applied Social Surveys in S3RI; the Manchester MSc in Research Methods; and London School of Hygiene Advanced Epidemiology course which may lead to an MSc. Students may attend the annual Epidemiology for Clinicians course jointly run by the Southampton MRC LEU and the University of Cambridge.

Transferable skills courses provided by the Graduate School include: Building relationships: Mentoring; Effective scientific writing; Employment outside academia; Abstract writing skills; Poster presentations; Fellowship applications; How to succeed at interviews; Introduction to Teaching skills; Networking skills; Oral presentation skills; Preparing your Viva; Voice Skills; and Winning CVs and job applications.

3. INCOME, INFRASTRUCTURE AND FACILITIES

3.1 INCOME

Our funding strategy has capitalised on the opportunities provided by SPCR membership to grow our research income steadily during the assessment period. Pump-priming SPCR funding totalling £4.9M for developmental and feasibility studies has enabled leverage of funds from major streams for multicentre studies, including 16 NIHR programme and trial grants, leading to high quality outputs.

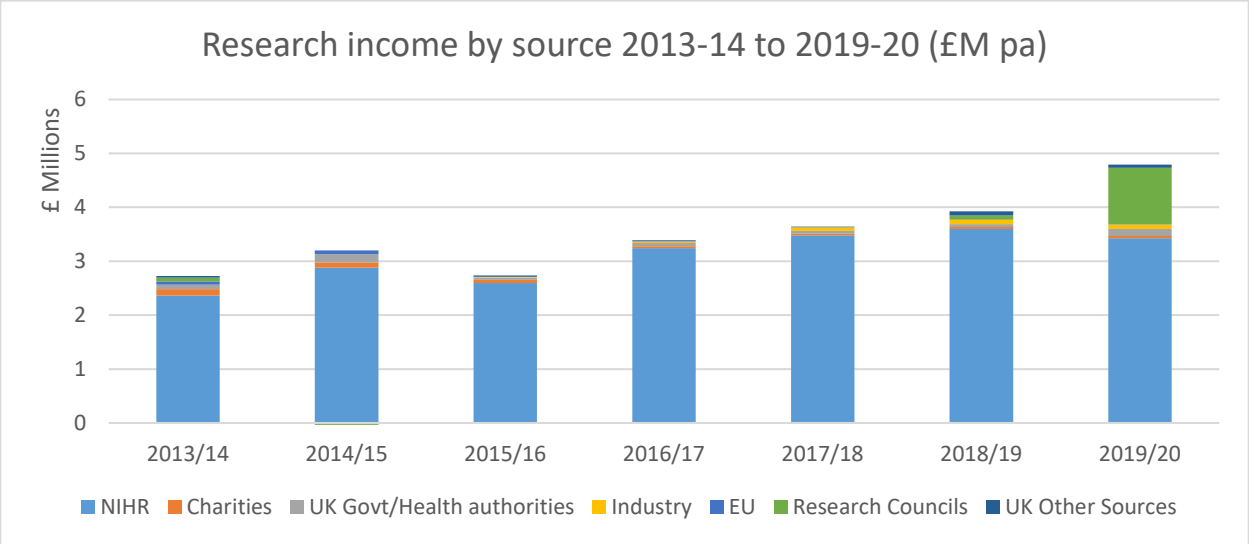
Two examples are the SPCR-funded Home-BP grant which enabled us to win the NIHR Integrating Digital Interventions into Patient Self-Management Support (DIPSS) programme grant for hypertension and asthma (**Little, Thomas**); and **Kendrick's** SPCR-funded CPRD antidepressant prescribing study, which informed the NIHR REDUCE Programme to reduce long term antidepressant use: both addressing major issues for primary care to more efficiently manage chronic illness and long-term medication use.

Our annual research income has risen from £2.8M in 2013-14 to £4.8M in 2019-20. Total UoA2 income over the seven year period was £24.3M (compared to £9.0M for REF2014 over five years), including:

- £21.4M won in open competition from the NIHR;
- £1.1M from UK research councils;
- £568K from UK central governmental bodies;
- £418K from charitable sources;
- £272K from Industry;
- £226K from EU sources;
- £162K from other UK sources.

In addition, UoA2 was awarded **research income-in-kind** totalling £4.1M from 2013-20 (our share of the NIHR funding for the CLAHRC, led by Rogers (UoA3)). The average annual research income per FTE staff submitted was £256K from grants and £299K including income-in-kind.

The graph below shows annual research income by funding category: the large majority comes from the NIHR, but we have increased our research council income significantly since 2017.



Of 500 grant applications, 187 (37.4%) were successful. These included:

8 NIHR PGfAR programmes:

- DIPSS on asthma and hypertension (total *including all partners* £2M);
- CLASP on cancer survivorship (total £2M);
- PRIME on acute respiratory tract infections (RTIs) (£2M);
- ECO on eczema management (£2.7M);
- REDUCE on antidepressant reduction (£2.4M);
- RECON on cognitive decline (£2.3M);
- STREAM on malnutrition (£2.2M);
- RECUR on recurrent RTIs (£2M).

8 NIHR HTA trials:

- ARTIC-PC for childhood RTIs (£1.2M);
- BREATHE for asthma (£1.5M);
- ACTIB for irritable bowel syndrome (IBS) (£700K);
- BATHE on emollients for eczema (£960K);
- SAFA on spironolactone for acne (£1.7M);
- PROMDEP for assessing depression (£1.6M);
- ATLANTIS on amitriptyline for IBS (£1.7M);
- SupportBack2 on back pain (£1.2M).

3 NIHR RfPB studies:

- PROMDEP feasibility trial (£240K);
- SupportBack1 feasibility trial (£240K);
- Delayed antibiotic prescribing for RTI evidence synthesis (£290K).

The SPCR funding has also provided:

Support for the next generation of researchers through small project grants, fellowships and 'seedcorn' and 'bridging' funding to support researchers flexibly, enabling ECRs to obtain initial success and a track record for approaching other funders;

The ability to address major public health issues, where it is difficult to get funding: e.g. trials of herbal and other alternatives to antibiotics for infections (ATAFUTI assessing Uva-Ursi and anti-inflammatories for UTIs; and HATRIC investigating Pelargonium for chest infections (**Moore**));

Funding very large-scale definitive projects which are difficult to fund otherwise: The prime example here is the multicentre CANDID cohort (**Little**), the first substantial prospective primary care cohort to develop and validate a decision rule for the diagnosis and referral of patients with lung or colorectal cancer (current risk scores are based on retrospective, poorly recorded data). Recruiting >20,000 patients, it will provide landmark data on cancer diagnosis;

Strengthening public involvement and engagement: establishing a dedicated PPI officer within PPM; funding innovative 'reaching out' work facilitating longitudinal relationships with community organisations to broaden PPI; and training for public contributors including involvement in governance and strategy.

3.2 INFRASTRUCTURE

PCRC is based at Aldermoor Health Centre, close to public health, respiratory, liver, cardiac and renal disease Medicine and Health Sciences colleagues, based at the nearby UHS. Analysis of our research is largely office based. All staff and students have access to desktop computers, specific equipment provided for large databases (CPRD, CHIE) and database managers, and can draw on University IT (iSolutions), Finance, and HR (Ask-HR) support.

Since 2014 we developed the capacity to analyse large primary care datasets including the CPRD and CHIE databases of computerised GP medical records. **Kendrick** employed a full-time data manager (Newell) for an SPCR-funded CPRD study of 396,000 patients over 10 years which showed long-term antidepressant prescribing was continuing to increase, leading to the NIHR PGfAR funded REDUCE programme on reducing antidepressant use. **Francis** and **Santer** led a CPRD study on acne management, informing another PGfAR application. **Moore** and **Lown** with Roderick (UoA1) are using the CHIE local primary care dataset of 1.4 million records to evaluate outcomes of treating infections, acne, kidney, and liver diseases.

The UKCRC registered CTU (Director Griffiths) now has an extended remit, with dedicated staff working with primary care (Nuttall Head of Non-Cancer Trial Management; Thomas coordinator), and systems and processes in place to produce MHRA-compliant FDA licensing-quality data (including electronic remote data capture (RAVE), quality assurance, and the safety desk).

3.3 RESEARCH SUPPORT

The University's Research & Innovation Services (RIS) provide support for horizon scanning and influencing calls; targeting calls to investigators; providing bid support (assessing eligibility, providing generic statements, impact statements and ethics processes); organising internal peer review and mock interviews; providing the University EU office; and project-managing multi-faculty bids. Faculty research support includes a dedicated senior research manager, two support officers and a business development manager, working with the Associate Deans for Research and Enterprise.

Our Finance system uses Agresso Awards Management to monitor applications and success rates for individual investigators, facilitating responses to particular needs, e.g. organising externally run grant-writing workshops targeted to first time applicants, or to those with low success rates.

The Faculty Research Management Committee dispenses peer-reviewed awards of up to £15K to pump-prime ECRs and inter-faculty collaborations, or as contributions to multi-user equipment. From 2014-2020, 77 awards were made, totalling £488K, yielding preliminary data supporting new applications to external funders, and initiating collaborations, mostly with other faculties. A second scheme provides research expenses for NHS-contracted ACFs to provide grant-writing practice.

A dedicated research manager (Kelly) supports PPM governance and ethics approvals, and grant management, maximising researcher productivity. The RDS South Central (Director Reading) provides wide ranging expertise (PPI; statistics; trial design; health economics; qualitative research) to help develop funding proposals. Böhning (S3RI) and statisticians in PPM and the MRC LEU provide additional statistics support. **Raftery, Yao** and Zhu provide health economics input to trials and evaluations, with particular expertise in costs and benefits of trials, of over-diagnosis or overtreatment, and Value of Information studies.

We provide active support for applications for postdoctoral and senior fellowship awards. **Leydon** was a representative on the Faculty of Medicine Postdoctoral Committee which runs a mentoring programme open to all staff (not just postdoctoral). Our widespread collaborations have resulted in several jointly supervised training posts in other University groups (e.g. with Barker in the MRC LEU; and Yardley and Bishop in Health Psychology) and other universities (e.g. University College London (UCL) and Kings College London (KCL)).

Internal and Cross-Institutional dissemination of Research

Opportunities include monthly seminars within PPM with internal and external speakers; other Faculty seminars (e.g. the MRC LEU programme); the annual PPM PhD conference with oral and poster student presentations; and Population Health cross-faculty seminars, conferences and networking website.

The Faculty's Annual Research Conference offers postgraduate students, ACFs and postdoctoral researchers the chance to present their work orally, or through posters, and concludes with a distinguished lecture (recent lecturers include Professor Steve Jones and Sir Stephen O'Rahilly). This complements the Faculty's Annual Translational Research Conference, in partnership with UHS, showcasing NIHR-portfolio research and concluding with the annual Wade Lecture (recent lecturers include Prof Dame Sally Davies and Sir Jeremy Farrar).

Conference attendance funding

Our PCRC conference allowance, funded from PPM Academic School reserves, enables ECRs, doctoral students, trainees, and junior academics to attend conferences and present their work, including at South West and national SAPC Annual Scientific Meetings, RCGP Annual Conferences, and other conferences for which they have abstracts accepted. Since 2014, 95 conference awards have included 47 to ECRs, 34 to research students, and 14 to junior academics, totalling £54K (£44K to female staff and £10K to male).

Exchanges between University and NHS staff

We work with GPs developing proposals for NIHR IPFs, of which we have had two since 2014. We initiated an 'Apprenticeship' scheme in 2018 to enable GP and other health professional learning in primary care research. Since then, five GPs, one occupational therapist, one dietician, two mental health nurses, and two psychiatrists have each received £1,000 to buy out time to attend research team meetings and undertake research activities.

Patient and Public Involvement

PPI helps us at all stages from inception to publication, including identifying research questions, improving study processes and materials, interpreting findings, and shaping final reports and dissemination. PPI academic lead (**Santer**) appointed an SPCR-funded PPI lead (Newman), initially half-time but aiming for full-time. We work with the Wessex PIN collaboration of nine NIHR organisations, and other academic (SPCR), NHS (GP Patient Participation Groups) and charity partners to strengthen our PPI.

We have 39 regular public contributors (increased by 31 since 2018) and carry out innovative '*reaching out*' activities seeking diverse engagement, building sustainable relationships with community groups. Three public contributors are involved in our governance, including membership of research strategy and PPI steering groups, staff awaydays, events to support spreading best practice in PPI, and strengthening two-way communication between researchers and the public through newsletters and study and institutional websites.

We are developing processes for monitoring and capturing examples of impact of PPI, working towards strengthening two-way feedback, and continuing to work towards embedding the UK standards for public involvement in all our research.

4. COLLABORATION AND CONTRIBUTION TO THE RESEARCH BASE, ECONOMY AND SOCIETY

4.1 COLLABORATION

All our research is multidisciplinary, with patients, clinicians, statisticians, social scientists, behavioural scientists, health economists, and/or data managers. It usually involves collaboration within the Faculty and across the University, in particular with the LEU; BRC; CES Respiratory, Liver, Cardiac and Immunology groups (UoA1); Health Sciences (UoA3); Health Psychology (UoA4); S3RI (UoA10); and ECS (UoA11).

Thomas and **Francis** are working with the BRC (Wilkinson, Djukanovic and Howarth, UoA1) on COPD, asthma and respiratory infection, looking at behavioural interventions and biomarkers for asthma. **Moore** collaborated with Clarke in Microbiology and Roderick in Public Health (both UoA1) on community studies researching vaccine effectiveness, and epidemiology of post-operative wound infection. **Moore,** with Sheron, Parkes and Roderick (all UoA1) set up the cross-faculty Wessex Alcohol Research Centre to improve early identification and feedback of risk of alcoholic liver disease in primary care. **Francis** is working with the pharmaceutical company Synairgen plc to evaluate inhaled interferon beta as a treatment for COVID-19.

Major NIHR programme and trial grants support collaboration with *Oxford, Cardiff, Bristol, KCL, UCL, Bangor, Leeds, York, Nottingham, Hull and Liverpool*. In addition to grants we have led on (§3.1), **Little** worked with *Oxford* on the TASMIN-SR BP telemonitoring and self-management trial; BARACK-D trial of aldosterone receptor antagonism in chronic kidney disease.

Moore worked with *Oxford* on the MERIT trial of D-mannose for recurrent UTIs. **Little** and **Moore** worked with *Bristol* on the CEDAR trial of analgesic drops for otitis media; with *Nottingham* on the HEAT helicobacter eradication trial; with *Keele* on the ROSE systematic review of Rosa canina for osteoarthritis; and *Imperial* on the Endobarrier jejunal sleeve trial for inducing weight loss.

Kendrick collaborated with *York* evaluating the QOF health checks for people with severe mental illness; with *UCL, Bristol, York* and *Liverpool* on the PANDA programme on predictors of

antidepressant response, and with *UCL, Bristol,* and *York* on the ANTLER placebo-controlled trial of maintenance antidepressants to prevent depression relapse (with **Moore**).

Thomas collaborated with *East Anglia* on the ARRISA trial of asthma risk registers with Internet support; with *Nottingham* on the FAST trial of steroids for asthma; with *Oxford* on the MACRO trial on rhinosinusitis; and *Aberdeen* on the RACEENO trial of nitric oxide measurements for childhood asthma.

Leydon is co-investigator on the HaRI study with *UCL*, on patient and GP Internet use in consultations. **Santer** collaborates with *Bristol* and *Nottingham* on the BATHE, BEE and SAFA dermatology trials, ECO programme, TEST study of allergy testing in eczema, and Cellulitis experience survey, as well as CONTACT and T2T trials of gout treatment and prevention with *Keele* and *Nottingham*.

Everitt co-leads the ACTIB trial of CBT for IBS with Moss-Morris at *KCL*; the ATLANTIS trial of amitriptyline for IBS with *Leeds* and *Bristol*, and the Empathica study with collaborators at *Keele* and *Oxford*. **Lown** collaborates with *Oxford* on the PRINCESS trial of probiotics to prevent nursing home infections. **Stuart** is working with *Nottingham* on the Harmonising Outcome Measures in Eczema project.

Internationally, **Little** and **Moore** collaborated on the large EU Prepare consortium, completing the definitive FP8-funded ALICE primary care trial of antivirals for influenza with Goossens (*Antwerp*), Verheij (*Utrecht*), and Butler (*Cardiff*). **Kendrick** and **Geraghty** collaborate with Löwe in *Hamburg*, on antidepressant reduction and stress research, and with Gunn in *Melbourne* on antidepressant reduction. **Francis** has a substantive position as a Senior Researcher at the Antibiotic Centre for Primary Care in *Oslo*. **Moore, Willcox, Francis, Little** and **Thomas** work with the Centre for Evidence-Based Chinese Medicine in *Beijing* on systematic reviews and research on traditional medicines for COPD. **Willcox** collaborates with *Ugandan* universities, on family planning research. **Stuart** and **Little** with Yardley (Health Psychology) work with *Bristol* and *Beijing* Universities to develop and trial interventions to reduce antibiotic use in rural China. **Lown** collaborates with the American College of Chest Physicians on respiratory infections.

Collaborative research training

Our SPCR-funded research students and trainees access SPCR support, networking and training, including an annual Trainee Conference, mentoring, and training programme, including involving public contributors. SPCR Clinical Trials Fellowships help develop researchers from initial pre-doctoral training to senior post-doctoral research. Visiting Speaker Awards offer NIHR Academy Members opportunities to present their research, networking with other parts of the NIHR Infrastructure. The NIHR Short Placement Award for Research Collaboration (SPARC) scheme allows SPCR trainees to network within the NIHR, to train in a specific technique, or collaborate with researchers and specialists. The SPCR funds one place per year on the Oxford International Primary Care Leadership Programme (formerly the Brisbane Initiative), to develop future leaders in primary care research, and also one place per year on the TUTOR-PHC interdisciplinary research training programme funded by the Canadian Institutes of Health Research.

We contribute nationally to SPCR collaborative working groups on Evidence Synthesis (**Stuart**), Analysing Databases (**Kendrick**), Mental Health (**Geraghty, Kendrick, Moore)**, Digital Health (**Little)**, and Conversation Analysis (led by **Leydon**).

4.2 IMPACT ON HEALTH POLICY, NATIONAL AND INTERNATIONAL GUIDELINES

Our evidence informs national and international guidelines on antibiotic use for a variety of infections. **Little** chaired the NICE guideline development group (GDG) on delayed prescribing which has reduced prescriptions (see **ICS02-01**). **Moore** enhanced uptake of our research as RCGP Antibiotic Champion, and through membership of the NICE GDG on Pneumonia; ASPIC antimicrobial stewardship GDG; NICE technology appraisal group for Strep A testing; the DH Expert Advisory Group for de-linking reimbursement of antibiotics from sales; and the NICE Covid-19 Rapid Guidelines for Pneumonia group. He is on the government advisory board for antibiotics (APRHAI) and gave expert evidence to the Health and Social Care Select Committee.

We have influenced clinicians and pharmacists, nationally and internationally, through antibiotic road shows with more than 80 general practices in England, and a very successful internet behavioural intervention to reduce prescribing among 246 practices in six European countries, materials from which are now used internationally (**ICS02-01**).

Kendrick is a member of the NICE GDG on Depression (since 2015), and six of his studies were included in the 2019 draft guideline update, relating to diagnosis and monitoring with symptom questionnaires, evaluation of psychological treatments, and antidepressant treatment, including withdrawal**.** He was a member of the NICE Advisory Committee for QOF and Clinical Commissioning indicators, providing primary care mental health expertise on a range of clinical care indicators.

Francis's interactive booklet and clinician training on RTIs in children, published in the *BMJ*, demonstrated safe reduction in antibiotic prescribing by 66%. Made freely available on the Internet, it has been viewed more than 200,000 times since 2014 by more than 70,000 users, and around 300,000 printed copies have been purchased for use in NHS organisations. GPs in Germany, Poland, Spain and North America have also used it, and it was translated into 12 languages. He won the Health and Care Research Wales Impact Award for this work in 2017. He sits on international (European Centre for Disease Control Technical Advisory Committee) and national (Public Health England, Public Health Wales, DH, Wellcome Trust, Academy of Medical Sciences (AMS), and Welsh Assembly Government) advisory boards.

Thomas was on the NICE Quality Standard Group for asthma, British Thoracic Society/SIGN Asthma GDG, European Academy of Allergy and Clinical Immunology rhinosinusitis GDG, and DH National Asthma Deaths Audit (chief author). He is primary care representative on European Respiratory Society Task Forces on Asthma Diagnosis in Adults, and Children and Adolescents.

Leydon's research with the Macmillan Cancer Helpline led to the introduction of training modules and changes in practice to improve the experience of calling patients and families.

Supporting NIHR infrastructure

Little was a member of the NIHR Strategy Board. **Francis** is Clinical Director for Primary Care for CRN Wessex. **Moore** was previously Wessex CRN primary care lead, and was on the Wessex NIHR Directors Group.

Working with the NHS and other providers

We receive Research Capacity Funding from Solent NHS Trust and Southern Health Foundation Trust who host our NIHR PGfAR programme grants, and work with them to grow local NHS research capacity, supporting research staff between grants, and providing one year 'Apprenticeships' for clinicians to become involved in research.

We work with the Anglo European Chiropractic Council University College to increase the evidence base for chiropractic therapies, and research capacity within the profession. **Newell** is building on our existing musculoskeletal portfolio with two PhD studentships. We established links with herbal medicine producer Pukka to support another PhD studentship. Future collaborations will develop herbal research supporting antimicrobial stewardship and pain relief.

4.3 CONTRIBUTION TO THE RESEARCH BASE, ECONOMY AND SOCIETY

Contributions to the sustainability of primary care and primary care research

We engage with medical students from Year 1 to encourage them to consider careers in primary care. **Little**, **Kendrick**, and **Everitt** have presented to the Year 1 Research Symposium, and AMS 'Inspire' medical student meetings. We offer joint SPCR/University-funded student summer research placements, and established the annual SPCR George Lewith Prize open to all UK medical students to recognise academic projects in general practice. Around 12 students per year conduct their BMedSc research projects in PCRC, with a view to achieving presentations and publications to strengthen possible applications for AFPs, leading on to ACF and CL posts.

We run an ACF support group for our GP and Public Health ACFs, including an email group, and quarterly meetings for peer support. The SPCR runs a national annual GP ACF conference and we fund our ACFs to attend and present their research whenever possible.

Developing best practice in undertaking and reporting research

Members of PCRC have been regularly involved in Chairing (**Little, Moore, Kendrick, Everitt, Francis**) and sitting on (**Santer, Everitt, Francis)** independent Trial Steering Committees and Data Monitoring Committees (**Moore, Santer, Stuart**) for primary care trials. **Little** led on initiatives to develop best practice in programme development and management, including PPI, in his role as Director of the NIHR PGfAR Board.

Editorial boards

Little was Associate Editor, *Family Practice*. **Thomas** was on the *Thorax* editorial board until 2017, and Associate Editor of *Primary Care Respiratory Journal*, until 2017. **Francis** was Associate Editor for BMC Family Practice. **Leydon** is linguistic editor for *Qualitative Sociology Review* and Associate Editor for BMC Family Practice. **Santer** is Associate Editor at *Research Involvement & Engagement.* **Stuart** is on the Editorial Board of *BMJ Evidence-Based Medicine.* **Dambha-Miller** is *BJGP Open* Editor and on the *BJGP* Editorial Board.

Fellowships, prizes, invited keynote and plenary presentations

Little is an emeritus NIHR Senior Investigator and Fellow of the AMS. He was awarded a CBE for services to General Practice research (2018) and the RCGP Discovery prize (2019), and gave the RCGP James McKenzie Lecture (2014). **Everitt** was awarded the RCGP John Fry Award (2016). **Kendrick** gave invited plenaries to the British Association for Behavioural and Cognitive Psychotherapies, and Primary Care Mental Health conference (Amsterdam, 2016). **Moore** was invited keynote speaker at the World Congress on Integrative Medicine (Berlin, 2017), won best abstract at NAPCRG conferences in 2016 and 2018, and best paper in 2016. **Thomas** delivered invited plenaries at the European Respiratory Society, European Academy of Allergy and Clinical Immunology, and UK Primary Care Respiratory Society. **Willcox** gave invited plenaries at the World Congress on Clinical Nutrition (Bangkok, 2016); World Congress on Integrative Medicine (Berlin, 2017); International conference on evaluation of Chinese Medicine (Beijing, 2017), and International Workshop on Ethnomedicinal abundance of Western Africa (Cotonou, 2018).

Grant, fellowship and REF panels

Little was Director of the NIHR PGfAR Board, and a member of the NIHR Senior Investigator Award and NIHR ARC awards panels. He is on the SPCR Board. **Kendrick** chaired the NIHR GP IPFs Panel. **Francis** is on the HTA General Funding Board and was on the HTA Antimicrobial Resistance Themed Board, and the Research for Patient and Public Benefit Board in Wales. **Thomas** was Research Chair, International Primary Care Respiratory Group, and on the HTA Primary Care panel. **Leydon** is an NIHR PGfAR selection panel member, and member of the HTA Expert Review College. Reading is a member of the NIHR RfPB South West Regional Advisory Committee, and the national RDS Strategy Group. **Santer** is on the NIHR PGfAR board. **Everitt** is a member of the RCGP Scientific Foundation Board. **Little** served on the RAE2008 Primary Care, and REF2014 UoA2 panels, and is serving for REF2021.

Our board representation and alignment with NIHR and other funders therefore stand us in good stead for the future sustainability of the group.