

## UK Primary Care Research Portfolio Review

### 1. Background

In the decade since the Mackenzie II<sup>1</sup> and Mant<sup>2</sup> reviews of primary care research there has been considerable development in academic primary care in the UK. The breadth and depth of primary care research, summarised in this review of research registered on the UK Clinical Research Network database, is striking. A broad, generalist perspective is inevitable in primary care research but recent years have seen a step change in the depth, quality and international standing of research in primary care in the UK: well-exemplified in the results of the 2008 Research Assessment Exercise<sup>3 4</sup>.

Research in community settings has its roots in the discoveries of William Withering<sup>5</sup> (digitalis) and Edward Jenner (smallpox and vaccination)<sup>6</sup>. More recent exponents of general practice epidemiology include William Pickles, the Wensleydale GP who delineated the mode of transmission of infectious hepatitis and Edgar Hope Simpson, a Gloucestershire practitioner, who was the first to show that shingles represented a re-activation of the varicella virus<sup>7</sup>. Julian Tudor Hart, working in the Welsh valleys in Glyncorrwg was a pioneer of interventional cardiovascular epidemiology, whilst John Fry, John Howie and David Morrell laid the foundations of practice based research into people as well as patients.

**Epidemiology** provides an understanding of the processes by which people turn into patients, with Morrell showing that only one in forty of symptoms experienced in the community ever become the subject of a medical consultation<sup>8</sup> and David Hannay elaborating the concept of the illness iceberg<sup>9</sup>. Respiratory<sup>10</sup> and Gastrointestinal disorders<sup>11</sup> were an early target for general practice epidemiology, with important work on conditions such as heart failure<sup>12</sup> and chronic pain<sup>13</sup> as well as cross cutting themes such as deprivation and multiple morbidity have appeared more recently<sup>14</sup>.

Research into **health beliefs and expectations** is essential for understanding why a particular patient has chosen to consult on a particular day. Studies of patients' attributions of health and illness and their health locus of control began with the pioneering work of Roisin Pill and Nigel Stott in Cardiff in the 1980s<sup>15</sup>, and an important series of studies undertaken by Britten and her team on expectations, misunderstandings and concordance with management and therapy<sup>16</sup>.

**Screening and health prevention** are important opportunities in the general practice consultation and studies such as OXCHECK, the Family Heart Study, ProActive UK and SAFE42-44 have carefully looked at the role of screening, the identification of cardiovascular risk and the value of interventions. Excessive alcohol consumption and smoking have also been the subject of a number of influential trials undertaken in general practice<sup>17 18</sup>.

**Diagnosis** is, as Osler recognised, at the heart of the consultation. The diagnosis needs to be made early, accurately and safely and general practice research has contributed across all three dimensions. The detailed work on meningitis from Mant's group in Oxford<sup>19</sup> has acted as a template for studying the detailed natural history of disease onset, with individual symptom prevalence and trajectory being followed in different age groups of children hour by

hour. Harold Hin's work on coeliac disease<sup>20</sup> has greatly raised the profile of this condition, stimulating widespread attempts to ensure that patients at risk are appropriately identified and treated. A number of innovative approaches to making an accurate diagnosis have appeared in the general practice research literature, including Hobbs' studies of N-terminal pro-brain natriuretic peptide<sup>21</sup> and the influential work on the use of two or three screening questions for depression by Bruce Arrol and colleagues from Auckland, New Zealand<sup>22</sup>. Using the General Practice Research Database, Jones and colleagues have evaluated the significance of alarm symptoms in terms of making a safe diagnosis,<sup>23</sup> and Hamilton, Sharp and colleagues in Bristol have studied in detail symptoms in patients diagnosed with colorectal cancer<sup>24</sup> and lung cancer<sup>25</sup>. Much of this work is being systematically collected and made accessible by the Cochrane Primary Health Care Field<sup>26</sup>.

**Treatment** in general practice has been researched in a number of ways, from the description of the 'rule of halves' by Ritchie and Currie in 1983<sup>27</sup> (whereby only half of patients with a certain condition are identified, only half are treated and only half of them are treated adequately) and Griffith, Kinmonth and others identifying the key components of effective interventions in terms of the provision of patient information, adequate communication skills, and attention to emotional content<sup>28</sup>. Prescribing strategies, including the use of the 'deferred prescription', have been elegantly researched by Little's group in Southampton<sup>29</sup>. In cardiology the IMPROVE programme described the variation in quality of care provided by general practitioners in Europe<sup>30</sup>, and a similar survey undertaken by the European Society for Primary Care Gastroenterology has emphasised the range of treatment strategies being taken for the management of common gastrointestinal disorders in ten European countries<sup>31</sup>. Clarification of the value of testing for and treating *Helicobacter pylori* infection in dyspepsia<sup>32</sup> and the role of cognitive behavioural therapy in the treatment of irritable bowel syndrome<sup>33</sup> have been subjects of influential randomised controlled trials in general practice. In the field of acute diseases general practice research has helped to define the role of interventions in common conditions such as Bell's palsy<sup>34</sup> and conjunctivitis<sup>35</sup>.

**The care of chronic disease** is a major component of the work of general practice and the principles of chronic disease management in primary care have been explored and refined for cardiovascular, respiratory, gastrointestinal, genitourinary, musculoskeletal, neurological problems and diabetes. The key elements of registration, recall and regular review of the key components of care have been studied<sup>36</sup>. Measuring and assuring the **quality of care** in general practice is essential and the internationally-recognised work of Roland's group in Manchester in developing quality indicators, culminating in the introduction of the Quality and Outcomes Framework, a pay-for-performance system within the GP Contract, has received widespread international attention<sup>37</sup>. The QOF Database provides rich opportunities for an exploration of demographic, practice and other factors associated with the attainment of quality markers for disease management in general practice<sup>38</sup>.

Beyond these topics and methods, general practice research has also embraced mental health problems, musculo-skeletal disorders and, recently and importantly, various aspects of genetics (risk, early diagnosis, genetic counselling) in primary care. In terms of methodology generic health services research, epidemiological studies and trials have been complemented by a good deal of work on complex interventions, using the MRC Framework

as a guide, and a range of sophisticated qualitative methods to explore beliefs, understandings and behaviours.

Research in primary care has greatly benefited by the registration system of patients in the NHS, providing a unique and rich data source. The commitment of the National Health Service to research and development has been strengthened in recent years, with the establishment of the National Institute for Health Research, Schools of Primary Care Research in Wales, England and Scotland, the UK Clinical Research networks and Primary Care Research Networks across the country. The Research for Patient Benefit programme has provided a substantial boost to research funding in primary care and the applied community-based sciences.

With the creation of the Schools for Primary Care Research and the NIHR PCRN and the opportunities for the collaborative development the UK Primary Care Research Portfolio Review and Development Group was set up in 2007. This comprised representatives from MRC GPRF, NSPCR (England), PCRN (England) Primary Care Research leads from N. Ireland, Scotland and Wales, RCGP and SAPC (Appendix 1). The remit of the group was to develop an oversight of the primary care research portfolio in the UK and to facilitate the development of a programme of high quality primary care research. At the first meeting of the group on 27/11/07 it was agreed that there was the need to map current primary care research activity throughout the UK in order to identify areas of strength and important potential activity gaps.

## **2. Methods**

### **2.1 Phase 1: Identify an appropriate classification framework**

#### **Potential Frameworks for mapping of current UK primary care research portfolio**

Options considered included the MRC Topic Review Framework, the European Definition of Family Medicine<sup>39</sup>, the Mackenzie 2 Classification<sup>1</sup>, RAE2008 UoA8 declared research topics<sup>40</sup> (Appendix 2). UKCRC Health Research Classification System<sup>41</sup> (Appendix 3)

#### **Testing classification frameworks**

##### **1<sup>st</sup> classification exercise-UKCRN, Mackenzie (Modified) and RAE**

Four assessors were asked to classify 20 abstracts from the Society for Academic Primary Care (SAPC) Annual meeting 2007 using the UKCRC, Modified Mackenzie and RAE classification frameworks. Assessors were provided with copies of the abstracts and an algorithm for each classification framework describing how they should be used.

Observer variability was determined by calculating kappa scores which were low so after consultation with members of the UK Primary Care Research Portfolio Review and Development Group, it was decided to drop the RAE classification and substitute the Modified Mackenzie with European Definition of Family Medicine (WONCA) classification. Rather than choosing one classification per framework, it was agreed that multiple categorisation should be used in future which would allow inter and intra-rater reliability to be ignored. This means that a study about depression in diabetes would be classified in mental health and diabetes.

## **2<sup>nd</sup> classification exercise-UKCRN, European Definition of Family Medicine (WONCA)**

Six assessors were asked to classify 20 study protocols for primary care studies registered on the UK Portfolio Database using the UKCRC (modified) and the WONCA classification frameworks. Reviewers were provided with copies of the study protocols and an algorithm for each classification framework describing how they should be used.

Assessors did not find the WONCA classification suitable for the purposes of this exercise as it was not intuitive and reduced rather than enhanced meaningful output. Prof. Martin Roland suggested an alternative classification with 18 topic headings. Which incorporated most of the content of the WONCA and included terms that readers would be more familiar with (see Appendix 2).

Two assessors classified the 20 study protocols using the classification framework suggested by Roland and named as Topic Review Group (TRG) categories and the results were compared with the UKCRN and WONCA classification scores.

## **Society of Academic Primary Care (SAPC) Annual Meeting 2008**

The results of the 2<sup>nd</sup> classification exercise were the topic of a workshop at the SAPC 2008 meeting where **it was agreed by participants that the UKCRN and TRG classification frameworks should be used** to classify summaries of primary care studies on the Portfolio Database. On the basis of discussion at the SAPC workshop, the TRG classification was modified in the following way: two further categories were added ('Trial of treatment' and 'Other') and two others expanded (Whether 'Education/training' is doctor or patient and 'Health promotion' to include prevention). It was also agreed that a short classification framework should be added to the UKCRN and TRG classifications to cover **the setting** in which the research was taking place (Appendix 3).

Box 1

### **Agreed Classification**

1. 30 UKCRN Categories
2. 20 Topic Review Group Categories
3. 6 Setting categories

## **3<sup>rd</sup> classification exercise-UKCRN, TRG, Setting**

Assessors were requested to classify approx 20 study summaries each using the UKCRN, TRG and Setting classification frameworks. Each summary was scored independently by two reviewers. Assessors were advised that they should score in as many categories as appropriate for each of the three classification frameworks but should make a judgement regarding the areas (categories) to which the study is likely to make its main contribution to knowledge rather than have a peripheral involvement e.g. a study of depression in elderly patients with heart failure could have 3 UKCRN codes.

Pairs of Assessors were invited to reach agreement about their scores in the following way:

- 1) Assessor A considers Assessor B's categorisation and accepts/rejects
- 2 Assessor B repeats for the updated list produced by Assessor A
- 3) Email/telephone discussion of any outstanding discrepancies

The assessors who participated in the UK Portfolio Review are listed in Appendix 4.

## **2.2 Phase 2: Create and populate a database with research studies included on the UKCRN portfolio.**

Various options to define current research in primary care were considered including exhaustive surveys of all known primary care researchers in the UK. In order to expedite the process and focus on those whose quality has been assured by reference to specified criteria the primary care subset of UKCRN registered studies was chosen.

Abstracts of approximately 170 primary care studies registered on the UK Portfolio database were obtained either from the database itself where study information included a summary or by contacting the researcher named on the database and requesting a summary or protocol from which an abstract could be extracted.

It was then necessary to broaden the scope of the review in order to obtain summaries of other eligibly funded studies which were on-going across the UK but not registered on the UKCRN Portfolio database (as described in Box 2 below). PCRN managers and clinical leads were requested to identify research projects which fit these criteria and forward abstracts to SSPC. It was possible to obtain abstracts for approx 34 additional studies via this process and identify approx 20 more studies for which summaries were sought unsuccessfully. The basis of the report is the **204 studies** for which an abstract was available.

In order to widen the pool of reviewers to classify the additional studies identified via this process, PCRN Clinical leads were asked to nominate primary care researchers of senior lecturer grade or higher who could assist with this exercise.

### Box 2

Each of the four UK nations has developed specific eligibility criteria for studies that can be included in their respective portfolios.

In England, the Department of Health has determined that studies (clinical trials and other well designed studies which involve the NHS) that are funded by NIHR, other areas of Government, and NIHR non-commercial Partners are automatically eligible to be included in the Portfolio. [http://www.crnc.nihr.ac.uk/about\\_us/processes/portfolio/p\\_eligibility/faqs](http://www.crnc.nihr.ac.uk/about_us/processes/portfolio/p_eligibility/faqs). NIHR non commercial Partners are those organisations that:

- award research funds as a result of open competition across England with high quality peer review
- fund research that is of clear value to the NHS
- have strategic direction for the research that they fund.

Scotland names the eligible funder organisations on the CSO website <http://www.sehd.scot.nhs.uk/cso/index.htm>

## 2.3 Phase 3 Consultation exercise to prioritise potential research topics

The next stage in making the information useful to members of the public, patients, policymakers, clinicians and researchers was to consider which are the key topic areas which might fill the gaps. This survey did not seek to replicate the exhaustive processes used by funders to determine whether specific questions should be the subject of a call for proposals<sup>42</sup>. Some research areas with active research networks already have a formal process in place e.g. diabetes<sup>43</sup> and others are currently undertaking systematic exercises across clinical areas including primary care e.g. dermatology<sup>44</sup>.

## 3. Electronic Delphi Process

3.1 For each of the 30 UKCRN speciality areas a group of 6-15 experts<sup>1</sup> comprising a variable mixture of academic, clinicians, patients, and charities for each specialty area was identified by a snowball technique of approaching researchers and charities with relevant interests to suggest respondents<sup>45</sup>. Once sufficient names were available the group took part in a 3 stage modified Delphi process to prioritise potential research issues<sup>2</sup> by email<sup>46</sup>:

1. Generation of 1-6 potential research issues from each expert which formed the subject of the voting rounds.
2. Voting round 1 – All questions generated by the expert group are voted upon to determine which should be prioritised<sup>3</sup>. Members of the expert group were asked to give 10 votes to their highest priority, 9 to their 2<sup>nd</sup> priority and so on to a vote of one for the tenth priority.
3. Voting round 2 – Issues identified in voting round 1 were reconsidered<sup>4</sup> and up to 20 of them were voted upon in the same way to determine which were the top10 priorities.

### 3.2 Workshop discussion

The results of this electronic Delphi process were discussed with an invited group of patient representatives, clinicians and funders interested in dermatology and stroke research at a workshop in London (Appendix5). The dermatology group considered it preferable that a wider range of interests should be represented before agreement on a list of priorities. This group also agreed with the suggestion made by Brian Buckley who provided insight from a Urinary Incontinence prioritisation exercise that researchers

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<sup>1</sup> An expert is defined as 'an informed individual' – in this case primary care clinicians, researchers patients and funders with an interest in the specialty area.

<sup>2</sup> Unanswered questions and problems in the specialty area relevant to primary care e.g. *Does early antiviral treatment reduce the incidence of post-herpetic neuralgia?*

<sup>3</sup> Prioritisation is from the perspective of the expert based on their assessment of a range of factors including: the originality of the topic, the likelihood of an important answer being achieved, relevance to primary care.

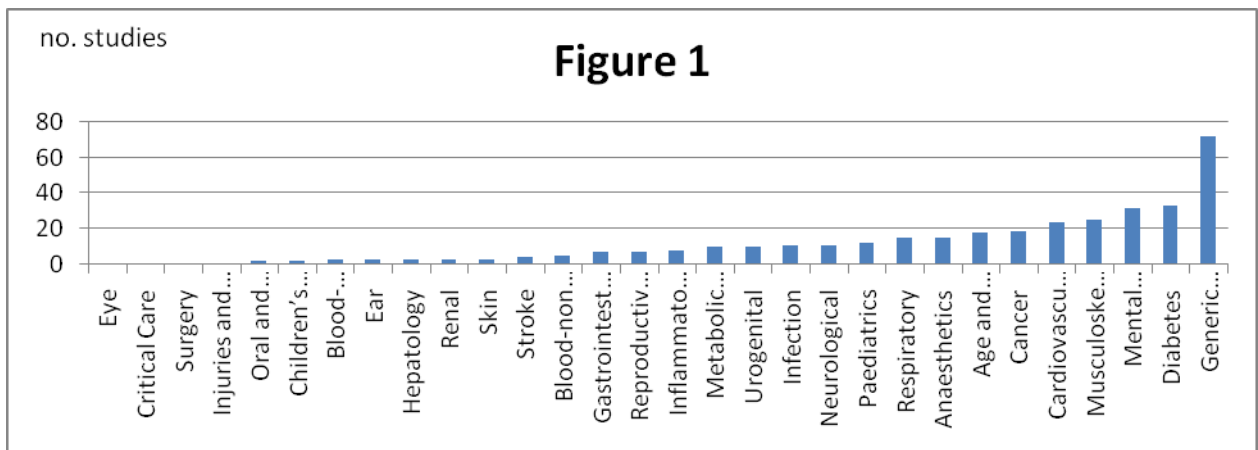
<sup>4</sup> At this point proponents of questions are asked to provide 2-3 sentences to justify their suggestion

should be excluded from the voting process due to their conflict of interest<sup>47</sup>. The stroke group were able to identify four priority topics that could be recommended in this process.

#### 4. Portfolio Review Results

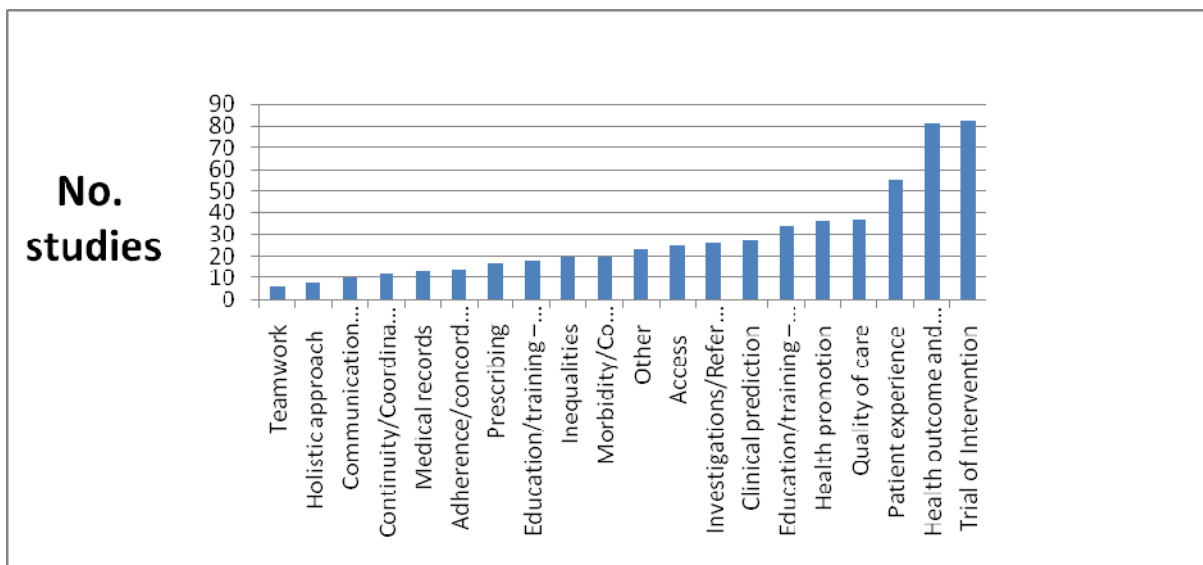
Figure 1 illustrates the variability in primary care research activity across the UKCRN categories. High levels of activity are evident in Public Health; Mental Health; Musculoskeletal; Diabetes and Cardiovascular Research. Much lower levels are obvious in Eye, Critical Care, Surgery, Injuries and Accidents Oral and Dental, Children's Medicines.

**Figure 1 - Primary Care Researchers by UKCRN Category:**



The TRG categories show activity in all areas of primary care research with an emphasis on Trials of Interventions; Health outcome and costs; Patient experience; Quality of care; Health promotion. Much less current activity is evident in Teamwork; Holistic approach ; Communication skills/shared decision making; Continuity/Coordination; Medical records.

**Figure 2 - Primary Care Research Activities by TRG Categories:**

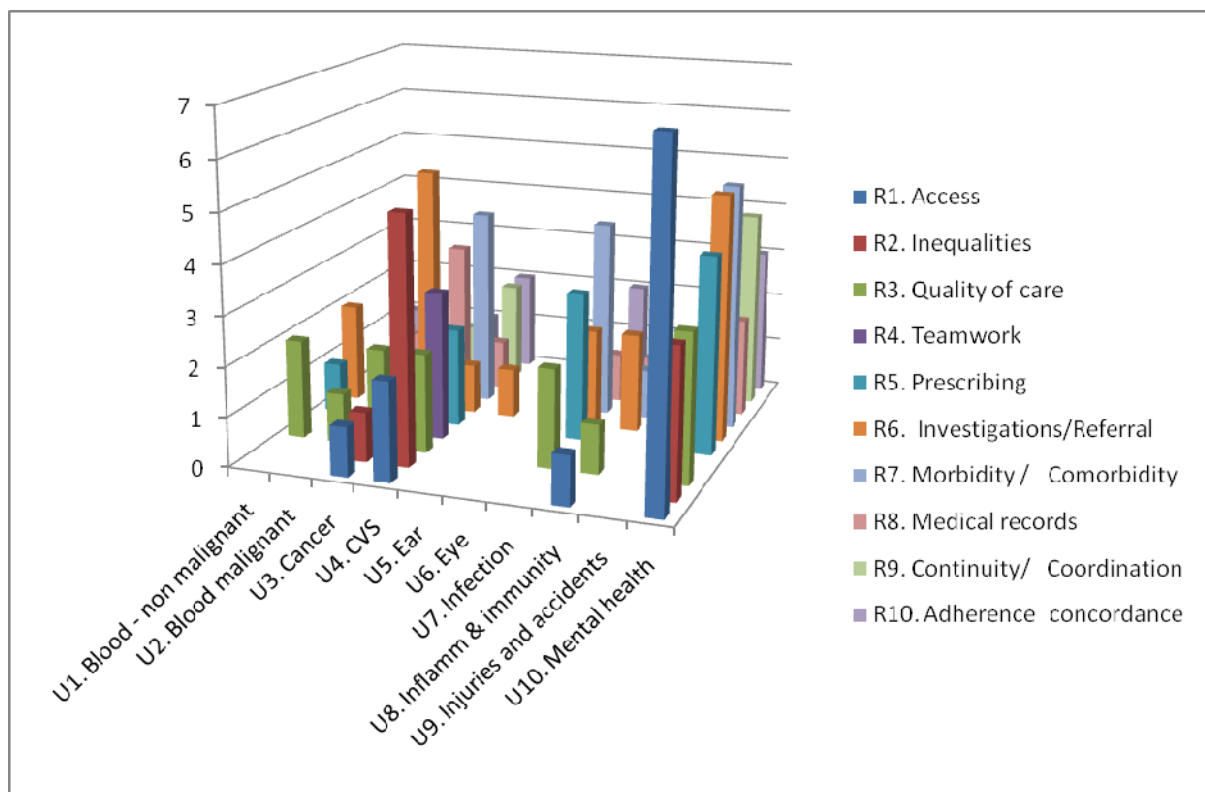


Appendix 6 tabulates the numbers of times the reviewers applied each of the three categories to each study. Tables 1-3 show these in a simple, uniaxial manner and tables 4a-4d provide the crosstabulations of UKCRN and TRG categories. The detailed tables show where some disease areas which are being actively studied nevertheless have some gaps in activities e.g. medical records in diabetes (table 4k), prescribing in musculoskeletal disease(table 4m).

Although the setting for more than half of the studies is Primary Care-General Practice there is primary care research occurring in a range of other settings. Topics where primary care research is being undertaken outwith NHS general practice include Cancer, Cardiovascular Disease, Mental Health and Diabetes.

The later tables and carpetplots of UK data (Appendix 7) highlight the detail of the types of research undertaken in each UKCRN category. Some subjects such as mental health are being addressed comprehensively across multiple TRG categories whereas other UKCRN categories such as Cancer are not: there are no primary care studies on the database addressing issues of Teamwork or Prescribing and only 1 in each of Access, Inequalities, Continuity/Coordination, Adherence/concordance, Communication skills/shared decision making, Morbidity/Co morbidity and Holistic approach.

**Figure 3 – Carpet plot showing Primary Care research Activity by TRG activity in selected UKCRN categories:**



In appendix 8 the carpetplots for individual less devolved nations illustrate the research differences between countries and significant gaps such as musculoskeletal disease in Scotland compared to England.

## 4.2 Results of the Prioritisation Exercise in Stroke and Dermatology

A list of topics in each of the UKCRN categories was produced with aggregation of those topics where there were insufficient researchers to create a voting panel (Appendix 9). When these were shared with members of the UKCRN portfolio group a request was made that further work to increase the likelihood that important topics were not omitted in each topic area would be valuable. As described in the methods section this additional step was examined in a workshop concentrating on stroke and dermatology. Each group reviewed the 10 topics which had been identified in the prior Delphi exercise. Each topic was discussed separately, and at the end of the discussion each member of the group allocated a score of 1-3 (1 being lowest priority and 3 being highest priority) to each of the topics. The resulting priority list was as follows:

### Prioritised Stroke Topics

**Topic 1:** GP identification and management of acute TIA/stroke at the time of presentation –  
score 17

**Topic 2:** Risk factors for secondary stroke - research to identify those factors (genetic, life style related, and therapeutic) which significantly modify the risk of developing a stroke subsequent to a TIA

score 15.

**Topic 3:** Longer term management of stroke in the community - the role of primary care. Research to include the assessment of psycho social problems following a stroke, the issues relating to early supportive discharge from stroke units to the community, and the potential to provide stroke rehabilitation in groups at sports centres

score 11.

**Topic 4:** Increased awareness of risk of stroke in the population and more effective means of increasing it in primary care

This example in stroke demonstrates how the portfolio review and prioritisation exercise requires further work in each topic area. A 'Top Ten Topics' list needs to be critically reviewed by groups of patients, clinicians and researchers who want to push forward in those areas such as is being done in dermatology at present<sup>48</sup>.



## 5. Discussion

The aim of this review was to map current primary care research activity throughout the UK in order to identify areas of strength and important potential activity gaps. This snapshot of primary care research activity registered on the UKCRN Project Register at the end of 2008 and additional prioritisation of potential topics provides a valuable but partial view of current research activity in UK primary care. The value depends on the accuracy and timeliness of the information it provides. Since the review only includes those studies which are eligible to be registered onto the UKCRN primary care portfolio it necessarily excluded those studies which did not adhere to the stringent criteria for inclusion. Important studies may thus not have been included, but all of the studies analysed for this report have satisfied strict selection criteria.

Some of the activity gaps may be partially filled by studies not included in the review, but the main areas of strength and weakness are evident. We should also acknowledge that reliance on the UKCRN portfolio and the additional studies suggested by the PCRN managers and clinical leads fails to take account of research undertaken in the past. This may mean that an area identified as a gap may in fact already have been extensively researched. The review also provides a partial view by focusing only on the UK. The European General Practice Research Network produced a report in 2009 on key research issues for primary care in Europe based on the alternative approach of key informant surveys and SWOT analyses among EGPRN national representatives <sup>49</sup>.

The results of this UK based exercise are intended to be used by individual academics, research groups and institutions as well as research funding organisations to inform the development of future primary care research activity. Some groups may wish to use the results in this report in its current form but it is more likely that others will wish to conduct more detailed prioritisation exercises in the areas which represent their own priorities.

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## References

- <sup>1</sup> Society for Academic Primary Care (SAPC). New Century, New Challenges: A Report from the Heads of Departments of General Practice and Primary Care in the Medical Schools of the United Kingdom. London: Royal College of General Practitioners; 2002. <http://www.sapc.ac.uk/docs/Mackenzie2.pdf> last accessed 15.03.09
- <sup>2</sup> Medical Research Council. Primary Health Care: MRC Topic Review. Medical Research Council: London, 1997. NHS Executive. R&D in Primary Care: National Working Group Report. Department of Health: London, 1997.
- <sup>3</sup> RAE 2008 quality profiles UOA 8 Primary Care and Other Community Based Clinical Subjects <http://submissions.rae.ac.uk/results/qualityProfile.aspx?id=8&type=uoa> last accessed 15.03.09
- <sup>4</sup> Howe A. UK General Practice is the best in the world. RCGP News March2009; <http://www.rcgp.org.uk/PDF/RCGPNews%20Feb09.pdf> last accessed 15.03.09
- <sup>5</sup> Aronson J. K. An Account of the Foxglove and Its Medical Uses 1785-1985. Oxford OUP ISBN13: 978-0-19-261501-5
- <sup>6</sup> Jenner E. An inquiry into the causes and effects of the variolae vaccinae. London, Sampson Low 1798
- <sup>7</sup> Hope-Simpson RE, The Nature of Herpes Zoster: A Long-term Study and a New Hypothesis. Proc R Soc Med. 1965 Jan;58:9-20
- <sup>8</sup> Morrell DC. Symptoms perceived and recorded by patients. J Roy Coll Gen Pract 1976; 26; 398-403
- <sup>9</sup> Hannay D. The 'iceberg' of illness and 'trivial' consultations. J Roy Coll Gen Pract 1980; 30; 551-4
- <sup>10</sup> Howie JG, Bigg AR. Family trends in psychotropic and antibiotic prescribing in general practice. Br Med J. 1980 Mar 22;280:836-8.
- <sup>11</sup> Jones RH, Lydeard SE, Hobbs FDR et al. Dyspepsia in England and Scotland Gut 1990; 31; 401-405
- <sup>12</sup> Davies MK, Hobbs FDR, Davis RC et al. Prevalence of left-ventricular systolic dysfunction and heart failure in the Echocardiographic Heart of England Screening study: a population based study. Lancet 2001; 358: 439-444.
- <sup>13</sup> Elliott AM, Smith BH, Penny KI et al. The epidemiology of chronic pain in the community. Lancet 1999; 354: 1248-1252
- <sup>14</sup> Mercer SW, Watt GC. The inverse care law: clinical primary care encounters in deprived and affluent areas of Scotland. Ann Fam Med. 2007 ;5:503-10.
- <sup>15</sup> Pill R, Stott N. Concepts of illness causation and responsibility – some preliminary data from a sample of working-class mothers. Social Science & Medicine 1982; 16; 43-52
- <sup>16</sup> Britten N, Stevenson FA, Barry CA et al. Misunderstandings in prescribing decisions in general practice: qualitative study. Brit Med J 2000; 320; 484-488
- <sup>17</sup> Wallace P, Cutler S, Haines A. Randomised controlled trial of general practitioner intervention in patients with excessive alcohol consumption. BMJ 1988; 297;663-8
- <sup>18</sup> Silagy C, Mant D, Fowler G, Lodge M. Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. Lancet 1994; 343; 139-42
- <sup>19</sup> Thompson MJ, Ninis N, Perera r et al. Clinical recognition of meningococcal disease in children and adolescents. Lancet 2006; 367; 397-403
- <sup>20</sup> Hin H, Bird G, Fisher P et al. Coeliac disease in primary care: case finding study. BMJ 1999; 318: 164-7

- 
- <sup>21</sup> Hobbs FDR, Davis RC, Roalfe AK et al. Reliability of N-terminal pro-brain natriuretic peptide assay in diagnosis of heart failure: cohort study in representative and high risk community populations. *BMJ* 2002; 324: 1489-94
- <sup>22</sup> Arroll B, Goodyear-Smith F, Kerse N, Fishman T, Gunn J. Effect of the addition of a "help" question to two screening questions on specificity for diagnosis of depression in general practice: diagnostic validity study. *Brit Med J* 2005; 331; 884
- <sup>23</sup> Jones R, Charlton J, Gulliford MC. Alarm symptoms in early diagnosis of cancer in primary care: cohort study using General Practice Research Database. *BMJ* 2007;334: 1040-8.
- <sup>24</sup> Hamilton W, Round A, Sharp D, Peters TJ. Clinical features of colorectal cancer before diagnosis: a population-based case-control study. *British Journal of Cancer* 2005; 93: 399-405.
- <sup>25</sup> Hamilton W, Peters TJ, Round A, Sharp D. What are the clinical features of lung cancer before the diagnosis is made? A population based case-control study.
- <sup>26</sup> Practical Evidence About Real Life Situations <http://www.cochraneprimarycare.org/pearls>
- <sup>27</sup> Ritchie LD & Currie AM. Blood pressure recording by general practitioners in north-east Scotland. *BMJ* 1983; 286; 107-9
- <sup>28</sup> Griffin SJ, Kinmonth A-L, Veltman MWM et al. Effect on health-related outcomes of interventions to alter the interaction between patients and practitioners: a systematic review of trials. *Ann Fam Med* 2004; 2(6); 595-607
- <sup>29</sup> Little P, Williamson I, Warner G et al. Open randomised trial of prescribing strategies in managing sore throat. *BMJ* 1997; 314; 722-7
- <sup>30</sup> Cleland JGF, Cohen-Solal A, Aguilar JC et al. Management of heart failure in primary care (the IMPROVEMENT of Heart Failure Programme): an international survey. *Lancet* 2002; 360:1631-1639
- <sup>31</sup> Seifert B, Rubin G, deWit N et al. The management of common gastrointestinal disorders in general practice. A survey by the European Society for Primary Care Gastroenterology (ESPCG) in six European countries. *Dig Liver Dis* 2008; 659-66.
- <sup>32</sup> Delaney BC, Qume M, Moayyedi P et al. Helicobacter pylori test and treat versus proton pump inhibitor in initial management of dyspepsia in primary care: multicentre randomised controlled trial (MRC-CUBE trial). *BMJ* 2008; 336: 651-4
- <sup>33</sup> Kennedy T, Jones R, Darnley S et al. Cognitive behaviour therapy in addition to antispasmodic treatment for irritable bowel syndrome in primary care: randomised controlled trial. *BMJ* 2005; 331; 435-7
- <sup>34</sup> Sullivan FM, Swan IRC, Donnan PT, Morrison JMM, Smith BM, McKinstry B, Davenport RJ, Vale LD, Clarkson JE, Hammersley V, Hayavi S, Daly FD. Early Treatment with Prednisolone or Acyclovir and Recovery in Bell's Palsy. *N Engl J Med* 2007; 357:1598-607.
- <sup>35</sup> Rose PW, Harnden A, Brueggeman AB et al. Chloramphenicol treatment for acute infective conjunctivitis in children in primary care: a randomized double-blind placebo-controlled trial. *Lancet* 2005; 366; 37-43
- <sup>36</sup> Greenhalgh PM. Shared care for diabetes: a systematic review. RCGP Occasional Paper 67. London, Royal College of General Practitioners, October 1994.
- <sup>37</sup> Campbell S, Reeves D, Kontopantelis E, Middleton E, Sibbald B, Roland M. Quality of primary care in England with the introduction of pay for performance. *N Engl J Med* 2007; 357: 181-90
- <sup>38</sup> Checkland K, Harrison S, McDonald R, Grant S, Campbell S, Guthrie B. Biomedicine, holism and general medical practices: responses to the 2004 General Practitioner contract. *Sociology of Health & Illness*. 2008;30(5):788-803

- 
- <sup>39</sup> European definition of Family Practice  
<http://www.woncaeurope.org/Web%20documents/European%20Definition%20of%20family%20medicine/Definition%20EURAshort%20version.pdf>
- <sup>40</sup> RAE2008: Units of assessment and recruitment of panel members <http://www.rae.ac.uk/pubs/2004/03/>
- <sup>41</sup> UKCRN Classification <http://www.ukcrc.org/PDF/Health%20Classification%20system%2014%20June%20.pdf>
- <sup>42</sup> Brown P, Brunnhuber K, Chalmers I, Fenton M, Hicks NJ, Young P, Moody J, Clarke M, Chalkidou K, Twaddle S, Forbes C, Glanville J, Timimi H. How to formulate research recommendations. *BMJ* 2006;333:804-806.
- <sup>43</sup> Clinical Studies Advisory Group Call for Research Group Proposals 2010 [http://ukdrn.org/csag\\_app.html](http://ukdrn.org/csag_app.html) last accessed 12.04.10
- <sup>44</sup> NHS Evidence - skin disorders <http://www.library.nhs.uk/skin/DuetsSubmissionForm.aspx> last accessed 24.7.10
- <sup>45</sup> Vogt, W. P. *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences*, London: Sage. 1999
- <sup>46</sup> Hall NG, Hershey JC, Kessler LG, Stotts RC. A model for making project funding decisions at the National Cancer Institute. *Oper Res.* 1992 ;40:1040-52.
- <sup>47</sup> Buckley BS, Grant AM, Tincello DG, Wagg AS, Firkins L Prioritizing research: Patients, carers, and clinicians working together to identify and prioritize important clinical uncertainties in urinary incontinence. *Neurourol Urodyn.* 2010;29:708-14.
- <sup>48</sup> Ridd M, Thomas K, Wallace P. Dermatology research in primary care: why, what and how? *BJGP* in press
- <sup>49</sup> . Hummers-Pradier E, et al., *Research Agenda for General Practice / Family Medicine and Primary Health Care in Europe*, European General Practice Research Network EGPRN, Maastricht 2009