

Appendices

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Appendix 1: Models of Capacity Building (Health, Research and Community) Evidence Table

Author Name; Model Name (brief reference details [Ref ID])	Source	Model Type	Description	Critique
(Birdsell et al. 2002)	Box Model [Early and <i>revised</i> versions]	Structural	Begins with concept of individual motivation, whereby motivation x ability = capability. Focus is on interest within organizations not individuals. Equation changed from capability to capacity. All boxes relate to organization level.	<p>Needs/Drivers: Later version introduced “External” containing drivers.</p> <p>Structures: Focuses only on organisational level, includes culture and tangibles</p> <p>Interventions/ Activities: Not specified</p> <p>Temporal: Concept of performance has sense of development</p> <p>Outcomes: Focuses on generic “rewards”</p>
(Birdsell et al. 2002)	Circle Model [Early and <i>refined</i> versions]	Structural	<p>24 dimensions of organizational research capacity categorized into one of five groups: external environment, structure, culture, people, and political dynamics. Structure is the hardware part. Culture is the software part. The people circle refers to individuals in the organization. Political dynamics overlay these three. Finally, the external environment is the backdrop within which the organization operates. All of these five groups, or variables, while separate in the model, are interdependent in practice.</p> <p>Structure, culture, and people are the variables organizations can do something about. It was tentatively proposed that through these three variables organizations do not just</p>	<p>Needs/Drivers: Political dynamics and external environment reflect drivers</p> <p>Structures: Structure is explicit in the model</p> <p>Interventions/ Activities: Not specifically identified</p> <p>Temporal: No sense of development or progression</p> <p>Outcomes: Not specifically identified</p>

			have to adapt to the external environment. They can actually shape it.	
(Boyd, Einbinder, & Rauktis 2004) http://www.aacrc-dc.org/public/pdfs/Building%20Research.pdf		Developmental step model	Model describes RCB in social care residential setting. Ten steps imply a sequential order. 1. Engage support from board of directors 2. identify willing staff. 3. identify resources 4. specify benefits and challenges 5. build collaborative partnerships 6. identify ethical and political and clinical issues 7. assess current state of research involvement in organisation 8. identify areas of interest. 9. identify areas of data sources 10. develop/use an research review process	Needs/Drivers: The notions that political factors should be identified and could influence the process Structures: Engaging different levels in organisation including directors and practitioners Interventions/ Activities: Around developing a research project Temporal: Stages are described around project development Outcomes
(Brazil 1999)	Model looking at evaluation capacity	Developmental	Evaluation capacity based on maturity of the organisation. Organisation moves from ad hoc evaluation based on specific projects to systematic evaluation Moves from focussed to broad perspectives of a systems community impact.	Needs/Drivers: Needs assessment seen as the opening sequence of a programme and should occur at regular development phases. Evaluability assessment is also advocated related to the feasibility of conducting a particular evaluation. Structures: Focuses on the level of organisations Interventions/ Activities: Variables that support evaluation capacity include: Organisational policy, adequate staffing, role definition of evaluator, location of evaluation unit and information capability. Temporal: Evaluation capacity viewed as developing over time and in stages. Outcomes. Outcome related to the evaluation

				projects themselves, their continuation, expansion or uptake in other areas.
(Breen et al. 2004) http://www.wrc.org.za/downloads/watersa/2004/Oct-04/1.pdf	World bank, Water Research commission	Developmental	The model looks at the potential of building research capacity within projects. Focuses on capacity building in individuals and institutions. Institutional capacity building strongly reflects the extent to which personal transformation has occurred and continues to occur.	Needs/Drivers: Importance of developing enabling conditions, and suggests indicators to measure this. Structures: Acknowledge change should take place individuals and in organisations Interventions/ Activities: building skills, understanding and activities to achieve a common purpose Temporal: the model includes 4 developmental phases Outcomes To measure 'profound change' including inner shifts in peoples values, aspirations, and behaviour, and outer shifts focussed at institutional level and reflects processes, strategies and practices systems.
(Brown, LaFond, & Macintyre 2001)	A framework for capacity building in healthcare.	Structural	Capacity building is a multi-dimensional, dynamic process, conducted on four levels which should lead to an improvement in performance at each of these levels, and contributes to the sustainability of the health system It is influenced by the external environment. Measurement and activities should occur at each level, although linkages between levels is also important	Needs/Drivers: acknowledges the external environment influences the ability to build capacity and includes cultural, social, economic, legal and environmental influences. Assessment of gaps before planning is advised. Structures: Individual/ community, health services personnel, organisation and health system. Interventions/ Activities: Activities are aimed at improvement in function of the system, improvement in the ability to perform within the personnel, and improvement in the ability of individuals to productively engage with the healthcare system Temporal: They state that the measurement of capacity over time is limited. Outcomes. The framework includes measurement of inputs, processes, outputs, intermediate outcomes, and ultimate outcomes at each of the

				structural levels. Ultimate outcomes relate to health status of communities.
(Cooke & Green 2000)	Focus is RCD in academic Nursing departments	Structural	The paper focuses on departmental Level of RCD, but acknowledges national and individual levels are important. It suggests that factors affecting RCD are numerous and complex.	<p>Needs/Drivers: Culture and motivation are highlight as factors influencing RCD.</p> <p>Structures: focuses on departments level but acknowledges other levels.</p> <p>Interventions/ Activities: developing culture, prioritisation (including subject specialisation), developing and maintaining links with service providers support with publishing and providing opportunities for skills development. Protected time, and strategies for motivating and encouraging research activity.</p> <p>Temporal:</p> <p>Outcomes Research productivity.</p>
(Cooke 2005)	Framework for measuring research capacity building in healthcare	Structural with enabling principles	<p>Structural levels</p> <p>Individual</p> <p>Teams</p> <p>Organisations</p> <p>Networks and supra-organisational levels</p> <p>Enabling principles</p> <p>Dissemination</p> <p>Infrastructure</p> <p>Skills and confidence building</p> <p>Close to practice</p> <p>Sustainability</p>	<p>Needs/Drivers: Need assessment included in the model and some recognition that policy influences the interventions and outcomes</p> <p>Structures: Clear structure in the model but stops at networks/ supra organisational structures. Acknowledges international collaboration</p> <p>Interventions/ Activities: Covers a range of issues including skills development through a range of interventions, through collaborations, and infrastructure including backfill, sharing intellectual capital and funding.</p> <p>Temporal: Some ideas around career progression and careers escalator, but not well explored at other levels</p> <p>Outcomes; Some discussion about intermediate and ultimate outcomes, and issues about process outcome. Examples of outcome measurement at all levels given</p>
(Crisp, Swerissen, & Duckett	General capacity	Structural	Four domains of interventions	Needs/Drivers: Trainees should be selected and

2000)	building model		<p>Top down, bottom up, building partnerships and community organisation.</p> <p>May need to focus on more than one domain of interventions for making an impact.</p>	<p>provide with opportunities to utilise skills</p> <p>Structures: organisations, communities and partnerships.</p> <p>Interventions/ Activities: Bottom up interventions include: training, skills and knowledge development, reflective practice. Top down includes: infrastructure and resources, restructuring to enable responsiveness, reflecting on policy and practice to look for gaps in knowledge/ service provision.</p> <p>Temporal:</p> <p>Outcomes Top down: Policy development, resource allocation, organizational implementation, sanctions and incentives. Bottom up: Workforce development programme, staff skills, understanding and participation, ideas generated and implemented. Partnerships: Community activation, information sharing, network density and reorientation of services/programmes. Community organising: involvement of key community leaders, people form disadvantaged groups and 'community ownership'</p>
(Del Mar C. & Askew 2004)	Model focussing on General practice	Developmental	<p>Looks at different levels of research engagement: users of research, Participants of research and leaders of research in primary care practitioners (Family doctors)</p> <p>Emphasis on facilitation practitioners to engage at the highest level, and to move them up the triangle from users to leaders</p>	<p>Needs/Drivers:</p> <p>Structures: Interventions should be based at national level, in university departments of family medicine, colleges and national academies, practice based networks, international initiatives and encouraging individuals.</p> <p>Interventions/ Activities: funding, fellowships, training and skills development, including opportunities for doctorates, and carrying out research alongside practice, and building research collaborations and partnerships.</p> <p>Temporal: Three staged model</p> <p>Outcomes Peer reviewed publications and relevance to implementation by clinicians and policy makers. Underlying purpose of RCB is to stimulate</p>

				intellectual rigor and critical thinking. Better critical thinking leads to more research better quality of care and enhanced intellectual rigor
(Dennis & Lansang 2004)	Developing world	Structural	<p>Structure is explicit in model at six levels.</p> <p>They emphasise enabling issues such as leadership, career structures, critical mass, infrastructure, information access, and interface between users and producers of research</p>	<p>Needs/Drivers: Model include identifying research priorities and acknowledges enabling and disabling factors to RCD</p> <p>Structures: individual, institutional, organisational, national health systems and supranational health research bodies</p> <p>Interventions/ Activities: Graduate or Postgraduate training, Learning by doing, Institutional partnerships and Centres of Excellence</p> <p>Temporal:</p> <p>Outcomes: Agreement amongst key stakeholders. No of salary scale of R&D personnel, Grant capture, Publications Assessment of research environment Discipline mix of national institutions Networking opportunities</p>
(Farmer & Weston 2002)	Model focussing on General practice.	Temporal	<p>Four groups on a continuum are identified to work with: non-participation, participating, managing and training, academic Uses a whole systems approach. Support is provided to each of the groups, and enables research practitioners to enter at any level in order to progress. Includes some 'guiding principles'.</p>	<p>Needs/Drivers: accommodating diversity and Barriers principles may need a diagnosis element but does not specifically explore this.</p> <p>Structures: Whole systems approach implies structural levels but these are not highlighted. Networks are discussed under the principle of networking.</p> <p>Interventions/ Activities: six principles for supporting progress include: accommodating diversity, reducing barriers, enabling collaboration and providing feedback and mentoring, and facilitating networking.</p> <p>Temporal: Four groups on a continuum: non-participation, participating, managing and training, academic</p> <p>Outcomes: Not specified</p>

(Frontera et al. 2006)		Structural	Five elements comprised: 1. researchers; 2. research culture, environment, and infrastructure; 3. funding; 4. partnerships; and 5. metrics.	Needs/Drivers: Recognises importance of societal and clinical needs but does not incorporate this in the model. Structures: Includes culture, environment and infrastructure. Interventions/ Activities: Does not specifically identify interventions/activities. Temporal: Does not discuss temporal aspects Outcomes: Includes suggested Metrics: Research trainees. Size of research cadre; Productivity; Federal agency expenditures on research.
(Gilliam et al. 2003)	Evaluation capacity rather than research capacity. Describes how the nation support branch of HIV/AIDS assists grantees from their funding body to evaluate their practice	Developmental	Types of evaluation: community planning, intervention planning, process monitoring, process evaluation, outcome monitoring, outcome evaluation and impact evaluation.	Needs/Drivers: Phases include initial assessment and diagnosis assessment to develop a plan of action Structures: Mainly focussed on organisation 'grantees' of a system of prevention programmes. Pulls in expertise to help organizations Interventions/ Activities: Training and support systems based on assessment Temporal: Evaluation capacity and level varies with time and maturity Outcomes: (within support organisations) Programme improvement, implementation of effective interventions, accountability to stakeholders. For the support system evaluation is around how the supported organisations use the support service
(Glickman & Servon 2003)	Measuring capacity development in housing corporations through partnerships	Structural(focussing on partnerships)	Evaluation of three different types of housing corporation examining their capacity building (the ability of the organisation to carry out its function more effectively) in relation to the partnerships they develop.	Needs/Drivers: Political issues are considered a measure for capacity building Structures: The paper looks at partnerships and the impact on capacity building Interventions/ Activities: mainly based around effective partnerships. Temporal: Outcomes. Measures outcomes across five

				domains: Resources, organisational, networking, productivity of programme and political capacity. Capacity building should be based on an organisational being able to carry out its function more effectively.
(Grindle & Hilderbrand 1995).	Framework based on case studies. General capacity building in the public sector.	Structural	This is a framework for assessing capacity gaps. Capacity interventions need to be strategic and sensitive to the interrelationships between the different dimensions of the framework.	<p>Needs/Drivers: Acknowledges that economic factors, political factors and social factors will influence all levels of capacity building.</p> <p>Structures: Organisational and 'human' (individuals and teams) levels</p> <p>Interventions/ Activities: individual level includes training, recruitment, utilization and retention. At an organisational level: setting goals, structure of work, incentive systems, leadership, resources, communication, behavioural norms and technical assistance</p> <p>Temporal: includes an assessment of the 'action environment' in organisation implying a stage conducive to capacity building</p> <p>Outcomes Outputs are in the areas of; effectiveness, efficiency and sustainability</p>
(Grundy & Johnston 2003)	Strategy based on literature in working with key informants.	Structural	Capacity developed focuses on the development of a trained body of researchers and the infrastructure in which research takes place.	<p>Needs/Drivers: Barriers include organisational structures and professional culture. Organisational and community context important. Setting research priorities clear in model</p> <p>Structures: Structural levels include individuals, organisations and communities and networks.</p> <p>Interventions/ Activities: Strengthening collaborations, building organisational and community capacity including evaluation models, and building skills in individuals</p> <p>Temporal:</p> <p>Outcomes Building researchers, specialists,</p>

				<p>community groups and consumers Research: prioritized by different bodies And influence of research evidence on policy and practice. Ultimate outcome (although not described as this) is improved health outcomes</p>
(Heinemann 2005)	Basic Logic Model	Structural	<p>Describes: selectiveness of research training programs, ways of measuring research productivity, impact on education, clinical practice and policy, increasing and tracking retention, and measurement requirements.</p>	<p>Needs/Drivers: Mentions agency priorities. External factors influencing success. Structures: Inputs and resources include faculty and trainees. Also mentions infrastructure. Interventions/ Activities: Focuses mainly on training and funding Temporal: Does not discuss temporal aspects but implicit in structure of model – with arrow indicating time. Outcomes: Presents short-term, intermediate and long-term outcomes. Includes suggested Metrics. outputs include publications, presentations and trainees who have completed a program, and utilities include benefits to society from increased knowledge and services derived from training (impact on education, clinical practice and policy).</p>
(Horton et al. 2003) http://www.idrc.ca/openebooks/111-6/#page_19 Chapter two	Capacity development in agriculture in developing world.	Structural	<p>Framework focuses on an organisation assessment framework focussed at an organisational level Has four elements: Organisational performance, organisational capacity, external operating environment and internal environment.</p>	<p>Needs/Drivers: Later chapters explore identifying needs and focus this on an organisational level. Structures: Model acknowledges organisational capacity in the context of other structures: individuals, teams, organisation and national institutions. Interventions/ Activities: Organisation capacity has two types: resources (staff and infrastructure like technology and financial resources) and management (leadership, programme management, networking and linkages) Temporal: The paper describes operational and</p>

				<p>adaptive capacity development. Adaptive capacity development enables the ability of the organisation to learn to change and respond to changing circumstances. Temporal issues are addressed in relation to adaptive capacity development.</p> <p>Outcomes Purpose is to improve performance, measured around four key indicators: effectiveness efficiency, relevance and sustainability. Should be defined by the goals of the organisation, its mission statement and informed by stakeholder expectations.</p> <p>Monitoring and evaluating organisational capacity development is critical to improving performance</p>
(Johnson et al. 2005)	Case example of developing an international RCD strategy on a specific health issue.	Hybrid model	<p>Model described as a planned system of change.</p> <p>Five stages of knowledge transfer: 1. initiation phase: agenda setting 2. Infrastructure change has to be matched to problem/ need in organisation. 3. Redefining/ restructuring the infrastructure to fit organizational structures. 4. Clarification in which the fit is more clearly defined. 5. routinising infrastructure changes as ongoing elements. Includes some structural issues</p>	<p>Needs/Drivers: A research needs assessment was carried out to identify needs and gaps in research. Research priorities were identified</p> <p>Structures: Research infrastructure development</p> <ul style="list-style-type: none"> • Organizational structure • linkages partnerships and champions • expertise • resources (funding, physical, technological and information) <p>Policies and procedures</p> <p>Interventions/ Activities: Partnership activities linked to building and strengthening scientific infrastructure and investigators skills; and addressing research needs of service delivery systems.</p> <p>Temporal: Proximal outcomes of the research partnership: including acceptance of partnership continued perceived usefulness of partnership activities and products, continued engagement in partnership and use of partnership products.</p>

				Distal (long range outcomes) of research partnership are to influence decisions about sustainability at the organizational level
(Joffres et al. 2004).	Capacity building in health care. Case study	Developmental	Three phases are described in the model: 1. Mobilization. 2. Development of a framework for action: 3. Implementation Capacity building is explained as a complex process subject to many interrelated factors. Facilitators and challenges to capacity varied depending on the phase of the project	Needs/Drivers: participatory action approach. Needs assessment part of this Structures: Focuses on capacity at the organisational and inter-organisational level at different stages of development Interventions/ Activities: Temporal: three phase of model Outcomes Outcome varied for different phases of project includes short term (5 year outcome) and ultimate outcomes which relate to whole initiative and covers domains of best practice, visibility in policy, availability of resources and change in values within the organisation.
(Jones et al. 2003)	Model developed from interviews with key stakeholders	Structural	Focuses on barriers and solutions to building research capacity in primary care practitioners	Needs/Drivers: The model was based on interviews with stakeholders. Barriers include lack of time and skills and isolation. Structures: Structures include individual practitioner and the system in which they operate. Interventions/ Activities: Solutions include mentorship, training, resources and networks, time out form practice. Temporal: Outcomes
(Macfarlane et al. 2005)	Medical Research Council General Practice Research	Developmental	Moves through 1. creative ideas, 2. concrete planning, 3. transformation,	Needs/Drivers: Includes examples of triggers in model. Also notes that research involvement is often in response to external events such as new national policies rather than strategically proactive.

	Framework		<ol style="list-style-type: none"> 4. consolidation to collaboration 5. Linkages. 	<p>Structures: The third phase (transformation) includes changes to infrastructure (especially administrative). Also refers to appointment of research manager. The structural unit is the primary care research team.</p> <p>Interventions/Activities: Identifies need for infrastructure funding, basic skills training, pump-priming grants</p> <p>Temporal: Practices move broadly through phases but movement neither predictable nor linear. May get stuck in phase or slip back and forth.</p> <p>Outcomes: No specific outcomes identified for entire process.. However identifies critical success/failure features for each phase..</p>
(Management Development and Governance Division Bureau for Development Policy 1998) http://magnet.undp.org/Docs/cap/Main.htm	Developmental capacity. Not health.	Structural	<p>Capacity issues apply at:</p> <ol style="list-style-type: none"> 1. individual level, 2. organizational or entity level 3. systems level. 	<p>Needs/Drivers: These are addressed primarily at the systems level</p> <p>Structures: Identifies that capacity development can operate at three levels. Structures operate mainly at entity level.</p> <p>Interventions/ Activities: Includes such elements as career progression and training.</p> <p>Temporal: No time dimension is acknowledged in the model itself. However an accompanying strategic management framework includes where we are now and where we want to be. There is also a schema for incremental versus transformational change.</p> <p>Outcomes: No specific discussion of outcomes.</p>
(Milen 2001)	World Health Organization	<p>Presents two frameworks:</p> <ol style="list-style-type: none"> 1. Partnership (little detail given) and 2. Levels (Hilderbrand & 	<p>Partnership not described.</p> <p>Levels are:</p> <ol style="list-style-type: none"> 1. Action environment 2. Institutional context 3. Task network (or system) 4. Organisation 5. Human resources (or 	<p>Needs/Drivers: Identifies “issues that are likely to have an impact on public sector capacities” e.g. policy values, labour market, political instability etcetera.</p> <p>Structures: This is primarily a structural model operating at five levels.</p> <p>Interventions/ Activities: Identifies training, use of</p>

		Grindle 1997) [see above] and Dimensions (Paul 1995) [see below].	individual) Dimensions are : 1. Human and institutional capabilities 2. Planning and implementation capabilities 3. Micro and macro dimensions 4. Cognitive versus practice dimensions.	external experts, mentoring, building joint ventures. Temporal: Acknowledges importance of incremental approach rather than “wholesale action” Outcomes: Identifies need to evaluate capacity building process, capacity outcomes (intermediate) and substantive development (final) outcomes.
(Moyer et al. 1999)	Community Health Research Unit, Ottawa, Ontario, Canada	Examines community capacity building, not specifically research.	Four stages of building collective capacity were identified: 1. identifying common ground, 2. working cooperatively, 3. working in partnership, and 4. working across the community.	Needs/Drivers: Identifying common ground involves recognition of organizational mandate, or current focus. Structures: Identifies “community structures”. Works at practitioner level with relationships with organisations and other stakeholders. Interventions/ Activities: Training mentioned Temporal: Each stage has different goals, activities, and products or outcomes. Progress from one stage to the next depends on ability of practitioner to engage with community, to learn about community resources and target population, and to implement program. Some overlap may occur. Outcomes: Mainly qualitative including engagement and empowerment.
(Neufeld 2001)	http://www.idrc.ca/en/ev-27407-201-1-DO_TOPIC.html			Needs/Drivers: Starts with national agendas Structures: Does not cover structures in this specific chapter but previously discussed. Interventions/ Activities: Itemises sample activities but not in systematic way. Temporal: No sense of a temporal dimension. Outcomes: Focuses on process rather than outcome
(North American Primary	http://www.stfm.o	Structural	Themes can be divided into;	Needs/Drivers: Does not explicitly identify role of

<p>Care Research Group Committee on Building Research Capacity & Academic Family Medicine Organizations Research Subcommittee. 2002)</p>	<p>rg/fmhub/fm2002/oct02/fd.pdf</p>		<p>Structures</p> <ul style="list-style-type: none"> • Infrastructure • Training • Funding • Publishing <p>Enabling issues</p> <ul style="list-style-type: none"> • Reputation • Linkages • Culture • Asking right questions 	<p>external drivers or needs. Structures: Focuses on structural issues identified from themes. No attempt at plotting interrelationships. Interventions/ Activities: Includes training, funding, prioritisation (<i>Asking the Right Questions in the Right Setting</i>) Temporal: No acknowledgement of temporal aspects although designed to feed into strategic plan. Outcomes: No articulation of outcomes.</p>
<p>(Paul 1995)</p>	<p>WHO – covers health service capacity not research capacity</p>	<p>Hierarchical</p>	<ul style="list-style-type: none"> • Human and institutional capabilities • Planning and implementation capabilities • Micro and macro dimensions • Cognitive vs. practice dimensions 	<p>Needs/Drivers: Includes simple conceptual framework for assessing country's needs and capabilities and deciding on appropriate mix of interventions Structures: Identifies importance of infrastructure. Interventions/ Activities: Covers interventions for health service capacity strengthening Temporal: Covers creation, maintaining and upgrading over time. Outcomes: Does not treat evaluation very extensively – focus on process.</p>

(Potter & Brough 2004)	Indian Health and welfare sector – focuses on development capacity, not research..	Hierarchical	<p>Includes:</p> <ul style="list-style-type: none"> • Structures, systems and roles • Staff and facilities • Skills • Tools <p>Aim = sustained programme development Too simple to look at training. Context is important. Think about issues of sustainability. Programme execution independent of personnel: need to develop sustainable and robust systems</p>	<p>Needs/Drivers: Does not identify needs and drivers – starts with “system to be strengthened”. However does introduce concept of diagnosis. Structures: Structures are hierarchical and can inhibit/ enable those above the structure. Uses capacity pyramid and identifies as prism. Interventions/ Activities: Describes inputs to build capacity e.g. equipment, technical skills. Temporal: Presents “Time to Implement change” underpinning each level of hierarchy Outcomes: Three themes</p> <ul style="list-style-type: none"> • Training= capabilities • Assistance and enabling issues • Institutional building
(Rossini & Porter 1981)	Model for interdisciplinary collaboration	Structural/ Process	<p>Includes:</p> <ul style="list-style-type: none"> • Leadership • Team characteristics • Study bounding • Iteration • Communication patterns • Epistemological factors 	<p>Needs/Drivers: Structures: Identifies both structure and process aspects Interventions/ Activities: Suggested activities include common group learning, modelling, negotiation among experts, and integration by leader. Temporal: Includes concept of development over time. Outcomes: Not clear [Abstract only]</p>
(Simon 2000)	Indicators for the Measurement of Research Capacity Strengthening Investments.	Structural	<ul style="list-style-type: none"> • Skills and competencies • Scientific activities; • Outcomes; • Impacts on policies and programmes 	<p>Needs/Drivers: Not clear [Abstract only] Structures: Includes levels of individuals, research groups, institutions, and nations Interventions/ Activities: Not clear [Abstract only] Temporal: Not clear [Abstract only] Outcomes: Includes both Outcomes (Intermediate)</p>

	Presented at the WHO meeting on research capacity strengthening in developing countries, Annecy, France WHO			and Impacts (Final)
(Stineman 2005)	Dynamic cycle of research capacity-building	Temporal (Cyclical)	<p>Proposes that best way to build strong and sustainable research capacity is to study and adopt component strategies developed by other medical disciplines and other nations.</p> <p>"Dynamic cycle of research capacity-building" is adapted from framework for studying eradication of infectious diseases in developing countries. Career mapping is proposed to measure research productivity among faculty. First and most important step in building rehabilitation capacity is developing an understanding of and belief in mission and need for research to support it.</p>	<p>Needs/Drivers: Includes assessing current capacity, also refers to strategic needs. Drivers include: Cultural Demands; Science Users; Advocacy; Policy Initiatives; Funding.</p> <p>Structures: Discusses research trainee, individual researcher, institutional, funding agency, national, and international levels. Infrastructure is placed at centre.</p> <p>Interventions/ Activities: Focuses on training, also considers funding, fellowships and mentoring</p> <p>Temporal: Includes concept of career mapping</p> <p>Outcomes: Discusses evaluation and metrics at level of new knowledge, improved tools, improved interventions and improved policies.</p>
(Tack & Heberlein 1987)	Educational research capacity. Not health	Temporal	<ol style="list-style-type: none"> 1. Determine research fit within organisational mission 2. Identify extent of research involvement 3. Identify necessary staff and associated costs 4. Allocate institutional funds 5. Monitor and evaluate research 	<p>Needs/Drivers: Handles drivers at an institutional level.</p> <p>Structures: Only works at a single level.</p> <p>Interventions/ Activities: No details [Abstract only]</p> <p>Temporal: Implies developmental process</p> <p>Outcomes: Evaluation is only of research services, not of interventions.</p>

			services.	
(Walker 1998) http://www.livingcities.org/pdf/community_dev_90_full.pdf	Community development model. Not health.	Developmental model	Elements of capacity: 1. The ability to plan effectively 2. The ability to secure resources 3. strong management and governance 4. program delivery capacity 5. the ability to network with other clients	Needs/Drivers: Advocates formal needs assessment Structures: Includes management and governance structures. Interventions/ Activities: Includes technical help and training. Temporal: Includes concept of development over time. Outcomes: Includes performance measures
(Wibberley, Dack, & Smith 2002)	This model is more to do with EBP (research minded practice) rather than RCD.	Developmental.	This model includes three levels: 1. Awareness 2. Engagement 3. Leadership Expect to find a visible research community, access to training and ongoing advice, and availability of resources.	Needs/Drivers: Includes agenda-setting as mechanism for handling needs Structures: Does describe infrastructure requirements but this is external to the model which focuses on an individual level Interventions/ Activities: Describes sample activities and markers but not within model. Temporal: Time is present in the form of a personal development process through three levels. Outcomes: The primary outcome is achievement of evidence based practice.
(Wimbush 1999)	Health Promotion research	Structural	Identifies following themes: <i>Infrastructure</i> <i>Culture</i> <i>Resources</i> <i>Research skills</i>	Needs/Drivers: Not considered beyond general evidence based practice. Structures: 'Infrastructure' includes specialist bodies to provide research services, advice and training; research training opportunities; and research specialists within the health boards. Interventions/ Activities: Includes networks, taught courses, research secondments Temporal: Not considered Outcomes: Not considered, focuses mainly on

<p>Web 1: (North American Association for Environmental Education website 2006)</p>	<p>Environmental Education http://eelink.net/pages/Capacity+Building</p>	<p>Structural</p>	<ul style="list-style-type: none"> • Structure = support through policy, funding, administration and implementation. • Program = support through instructional requirements, teacher resources, training programs and other elements. • Funding = sources, strategies and training that support both programming and structural components. 	<p>structures and processes. Needs/Drivers: Implicitly policy is in response to drivers but these are not identified. Structures: Structural components include policy, funding, administration and implementation Interventions/ Activities: specifically training and resources Temporal: Includes development but no specific temporal process. Outcomes: Has subsequently added evaluation to original definition of capacity building.</p>
<p>Web 2: (Community Building Resources (CBR) 2006)</p>	<p>Community Capacity Building and Asset Mapping Model© http://www.cbr-aimhigh.com/images/spistp99.jpg</p>	<p>Developmental</p>	<p>Six key steps in Community Capacity Building & Asset Mapping©.</p> <ol style="list-style-type: none"> 1. Define Question and Focus 2. Initiate 3. Planning For Community Conversations (Design Questionnaire and Database) 4. Talking, Discovering, Connecting (Conducting Survey) 5. Putting It All Together 6. Communicate - All the time with as many people as possible 	<p>Needs/Drivers: First stage is defining need and focus. Structures: Does not really consider structures. Operates at level of consultation processes. Interventions/ Activities: Not identified. Temporal: Defined as an onward and upward spiral. Outcomes: Outcomes not identified.</p>
<p>Web 3: (Appalachian Regional Commission 2006)</p>	<p>ARC Community Capacity Logic Model http://www.arc.gov/index.do?nodeId=2283</p>	<p>Developmental</p>	<p>Logic model includes:</p> <ul style="list-style-type: none"> • Project Context • Project Strategies • Project Outcomes <p>ARC Community Capacity Logic Model:</p>	<p>Needs/Drivers: Identifies contextual factors but these are seen as affecting implementation not driving developments Structures: Works at levels of Individual, Community and Organisation Interventions/ Activities: Only identified at a generic level</p>

			Resources-Contextual Factors- Activities-Outcomes	Temporal: Process flows from resources to outcomes although some projects may work back from desired outcomes. Outcomes: Only defined broadly at Environmental, Economic and Social level. No intermediate outcomes.
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Appendix 2: Needs Assessment Evidence Table

(* = full text)

Study ID	Target population	Objective	Method	Sample	Findings	Notes
(Bacigalupo, Cooke, & Hawley 2006)	Primary care and social care	To ascertain the activity, skills, willingness to engage in research and training needs of staff groups	Questionnaire	Gp Staff=95 Community Staff=305 Social care staff=67	Skills and training levels influenced willingness to conduct and get involved in research. Practitioner wanted practice based learning. Other areas of support required included protected time, mentorship, apprenticeship	
(Brooker 1997) *	Range of professionals all of whom had applied for funding to undertake research education or training.	To consider one aspect of DoH review (1994) which was to inform National Strategy to enhance NHS capacity to contribute to R&D, namely difficulties experienced by clinicians and managers in developing their research skills.	Postal Questionnaire (based on issues discussed with group discussion of 8 local professionals who had recently applied for research funding).	292 people – response 66% (168) after reminder. (but small numbers of certain professional groups)	Difficulties experienced: most problematic for whole group and for each of the professional groups was lack of feedback given by funding body on unsuccessful application (mean difficulty score 6.6)(where 0=no difficulty/8=extreme diff) Next: reduction of income that can often accompany research training (mean diff 4.9). Four other areas of moderate difficulty (scores of around 4) were career balance (lack of time); remaining 3 all to do with application process: knowing the type of research that would be supported; application	Altho this study did not seek a representative sample, the small numbers of certain professional groups suggest the findings should be treated with some caution. However strong patterns emerge

					skills required; information req'd about the schemes themselves.	
(Campbell, Roland, & Bentley 1999) *	Primary care	To describe extent and nature of current research capacity in UK and to identify future needs and priorities	Funding data requested from NHS National Programmes, NHS Executive Regional Offices, the Department of Health (DoH), Scottish Office, Medical Research Council, and some charities. Postal survey to relevant academic departments, and appropriate academic journals were reviewed (1992-1996). Interviews conducted with academic and professional leaders in primary care.	Numbers not given	Annual primary care R&D spend by NHS/DoH was 7% of total spend. Annual spend differs according to funding source. Journals relating to primary care do not with some exceptions (eg British Journal of General Practice, Family Practice), have high academic status. Research into primary care by academic departments is, with perhaps exception of general practice, small scale. Research base of most primary care professionals is minimal. Significant barriers need addressing if research capacity to be expanded.	
(Clifford 2001) *	Nurses, doctors and physiotherapy staff	To explore the role of research and associated training needs in the work of nurses, doctors and physiotherapy staff	Questionnaire	96 (27 nurses, 28 physios, 41 medical staff)	All respondents indicated a lack of research skills within their professional group (nursing group more positive). More than 50% in all groups identified training needs in: critical appraisal, IT, and interpreting statistical data	
(Cooke, Owen, & Wilson 2002) *	Managers, team leaders, senior practitioners in social care and public health representatives in health authorities	To identify research activity at health and social care interface; assess levels of, and opportunities to increase, research capacity within social	Scoping exercise using telephone interviews (1 st phase) and telephone interviews and focus groups in 2 nd .	Social care: 61 managers, team leaders, senior practitioners; health authorities: 6	Key activities at the primary care/social care interface: direct work with service users, interagency referrals, sharing information during assessment, coordination of packages of care and strategic planning. Levels of research skills among social care staff: existing R&D capacity in social services (SSDs)	

		services: to determine 'what works' in interagency collaboration and perceived needs for and barriers facing research capacity and activity in social care.		public health representatives.	<p>very limited – only 1 dept had a research section, no SSD had an R&D budget, research activity ad hoc.</p> <p>SSD skills needed for R&D at the interface with primary care: most SSD respondents had no experience of research training or activity although all social services staff had experience of audit. However there is evidence of research-related work in SSDs based on the enthusiasm of individuals in eg needs assessment, user surveys, project evaluation.</p> <p>Successful models of research collaboration between primary and social care eg joint planning groups, monitoring and quality assurance groups (eg area child protection committees), networks.</p> <p>Barriers perceived by SSD staff: lack of: confidence, research skills, time; workload; lack of cover and of supervision.</p>	
(Davies et al. 2002) *	Practice nurses	3 main aims: to assess level of research interest among practice nurses in Essex & East London; to identify their research priorities; to explore factors facilitating and impeding development of practice nursing research.	Questionnaire and follow up letters. Interviews of volunteer respondents (either individually or in focus groups).	1054 practice nurses, 426 responses (40%). 55 respondents volunteered for further participation and were interviewed	80% of respondents (n=333) thought that practice nurses should engage in research. About half (207) expressed interest in undertaking research. A third (145) had research experience. Those educated to graduate level ($P < 0.001$) and those working in practices with nurse training (< 0.001) or participation in external research (0.004) were most likely to want to undertake research (logistical regression model). Research priorities: long term health needs with high prevalence in local pop eg diabetes, heart disease.	

					Reasons: improving the service, career development. Main barrier to research: lack of time, (many nurse pt-time): 90% though protected time might help.	
(Glacken 2002) *	Registered nurses	To ascertain perceived R&D capacity of integrated trust in Northern Ireland.	Cross-sectional survey (using non-probability sampling strategy) collecting data via the R&D Culture Index (18-item, 4 point Likert scale addressing <i>Context, Knowledge/ skills, Intent.</i>)	786 nurses (277 responses – 35%)	No significant difference between male/female or for age, but higher grade nurses had more positive perception of trust's R&D culture. Problem areas in relation to <i>context</i> : absence of regular staff meetings to explore ideas (40%); lack of professional leadership (35%); lack of available help to support nurses to develop their practice (27.5%). In terms of <i>knowledge</i> : 39.9% disagreed that they understood research terminology, and same % reported lack of confidence in employing research findings. But in terms of <i>intent</i> : 82% willing to learn more about research, 92% 'keen to apply research to practice'.	
(Graffy & Stubbs 2005) *	All general practices in East London and Essex	To identify practice managers' involvement in research, their attitudes to research and training needs.	Postal survey	622 practices (510 with a manager) – 232 responses (45%)	145 (62%) of respondents had been involved in research (90 of these as a practice manager, 42 as part of a degree course). 45 (20%) had some research training. Most had a positive attitude to research: 2/3 finding it interesting, 35-40% seeing it as part of their role.	
(Grant 1994)	MD candidates	To determine initial	Questionnaire	56 resp	Need for intensive initial research training offered at	

	(in 1 teaching hospital and 2 postgrad institutes)	training needs and preferred methods of learning about conduct of research		respondents (53% response rate)	local level by the supervisor. The supervisor's subsequent role throughout the research period should be to provide ongoing specific critical help and support. Teaching materials and designed teaching sessions might be provided for supervisors..	
(Gray 2001) *	General practitioners and other health professionals in the East London and City Health Authority	Paper looking at the difficulties from a general practice perspective of participating in external collaborative projects	Semi structured interview guide was developed, with particular emphasis on difficulties encountered in participating in research. Draft guides were piloted with 2 GPs, a practice manager and a practice nurse at 2 practices. 19 semi structured interviews conducted	9 GPs, 4 practice managers, 3 practice nurses, 1 f-t research asst in 12 practices	Time constraints and motivation found to be particularly important; time was main obstacle to collaborative research. Motivation: admin staff get extra workload from external projects, but usually have the least influence on decision to participate; lack of ownership of external projects by the doctors can be a disincentive. Also a concern: the perception that external researchers have unrealistic expectations	
(Hurst 2003) *	Health care professionals	1 to analyse trusts' infrastructures and staffs' ability to implement the national R&D strategy. 2 to understand the demand for and range of R&D training locally and regionally. 3 to review connections between R&D training delivered locally, regionally and	Literature review; interviews; questionnaire. Reviewing relevant published and grey lit. Interviewing key R&D personnel in selected trusts. Surveying a stratified random sample of health care professionals about their R&D education and training needs.	284 questionnaire s returned	1 st ranked educational need: searching and reviewing the literature. 2 nd : gaining ethical and other approval. 3 rd : implementing findings. Others considered 'essential': research outcomes; quantitative and qual data analysis; writing research reports. No R&D knowledge, skill, learning and teaching method was rated 'neither desirable nor essential'. For learning mode: on site facilitator/mentor 1 st ranked (essential). R&D Direct (helpline), distance and web-based learning	Paucity of hard figures in this article; mainly percentages and rankings. Much of article is spent referring back to previous findings of other studies

		nationally. 4 estimate future investment in R&D training.			were least popular.	
(Kaner 1998) *	GPs (non-responders to a postal questionnaire)	To investigate GPs' reasons for not responding to postal services	A qualitative study was carried out to determine GP's reasons for not participating in postal surveys, which were drawn from a telephone survey of 276 non-responders to a postal questionnaire survey. Practitioners' comments were recorded and reasons for their non-response quantified using content analysis	269 GPs	Primary reasons for GPs not replying to the postal survey were that questionnaires got lost in paperwork (34%), that GPs were too busy for the extra work involved (21%), and that questionnaires were routinely 'binned' (16%). Higher practice workloads including incr admin meant that participation in research had become a low priority. GPs provided some suggestions for researchers that would increase chances of questionnaires being returned.	
(Lempp et al. 1999) *	Nurses working in academic departments of general practice and primary care (UK and Ireland medical schools)	To determine number of , demographic and professional profile of nurses employed in academic departments, including their employment status and views of their clinical work and professional development	Questionnaire	32 academic departments: sample size of 76 nurses with response of 60 (79%)	95% female; none from non-white community; age range 28-61. 77% graduates, of which 72% had or were studying for master's degree, 7% studying for PhD. 57% full-time; 85% had short term contract of 3 yrs or less. 40% paid on research scale, 40% on nursing scale. 19% as lecturers. Most of the nurses (64%) involved in research. Majority (60%) did not work clinically; 57% said that clinical work was important in their current job (to maintain registration and professional credibility, to update skills, to inform teaching/research).	

					Respondents' recommendations re promoting the role of nurses incl a career structure for nurses undertaking research, increased training and research support, clinical work to be recognised, research nurses to lead research.	
(Lester 1998) *	Junior academic GPs	To survey the research activity, perceived level of training, support needs, and career intentions of junior academics general practitioners	A postal, validated, semistructured questionnaire was sent to 121 jun academic GPs in the academic departments of general practice in the UK and Dublin. Main outcome measures were 'research activity score' as measured by publications in peer-reviewed journals and involvement in research projects, 'training score' devised from 13 skills required for both research and teaching, and perceived level of departmental support assessed by six different support mechanisms.	121 eligible junior academic GPs	Response rate 89% (108). 46 (43%) had no publications. 25 (23%) had no principal project. 39 (37%) had a mentor, but 51%.used mentor only for project supervision, none for career guidance. Males, responders who were predominantly involved with research rather than full-time teaching and those with better perceptions of their academic training all had significantly greater 'research activity' scores. Increasing departmental 'support scores' and length of time in the department were both significantly associated with more positive perceptions of academic training (P<0.05). Only 29 (27%) responders wanted to progress to senior positions within academic general practice	
(Loughlan 1998) (abstract only)	All medical staff, all nurses Grade F and above (inc specialist nurses and community midwives) and all	To assess degree of knowledge, understanding, perceptions and skills in relation to R&D of NHS staff	Purposive sampling using a postal questionnaire	50% resp rate	Nrly all respondents felt R&D played a vital role in the provision of health care services. Around 1 third of the sample had undertaken no research in past 10 yrs. Medical staff more and nursing staff less likely than PAM staff to undertake research (chi sq 15.77, p<0.0005) and PAM staff more and nursing	

	Professions Allied to Medicine (PAM) in Stirling Royal Infirmary				staff less likely to use research than medical staff (chi sq 15.09, p<0.0005). The main barrier to research was time; other barriers inc funding and lack of knowledge. Improvement in skills eg statistics, putting results into practice, critical review of literature required. Need for improved access and info about library facilities. Understanding of critical appraisal and systematic review was poor. Non-medical staff had poorer grasp of research terms than medical staff.	
(Moore 1999) *	Primary care and GPs	To assess nature and volume of research requests received by primary care teams as possible explanation of declining response rates	18 volunteer practices from the 6 health authorities within the former Wessex region, collected all research requests received in a 3 month study period. Practices were encouraged to differentiate between (true/systematic) research, and correspondence masquerading as research (market research, needs assessment). Requests analysed for source, scope, nature of collaboration sought, project design, time commitment, and incentive offered.	18 practices	184 items returned; 82 (45%) were excluded from further analysis. Each practice received between 0 and 13 true research requests (extrapolation: an average practice receives 16-24 research requests annually with some practices receiving over 50). Research topics included disease management, health promotion, management issues. Most common method: questionnaire to a health professional.	
(Omar 2006) *	Recipients of NHS R&D support funding in England	To assess provision of methodological support for health researchers incl funding and alternatives if no funding available. (Context: reviews of peer-reviewed health studies highlight	Questionnaire	25 trusts – all major recipients of NHS R&D support funding (100% response)	18 Trusts reported having dedicated funding for a methodologist. Of the 7 trusts with no dedicated funding, 4 reported to have an arrangement with a local university another partner and the remaining 2 did not appear to offer any form of support. For 2 Trusts only support was short statistical advisory	

		problems with methodological quality)			sessions or e-mail advice from a statistician. 14 Trusts offered free methodological advice , altho this was limited to a 1hr session in some. Overall there did not appear to any relationship between the R&D funding for method. support and the annual number of registered projects.	
(Rait 2002) *	General practice: all practices in North Central Thames	To gather information about perspectives, barriers to participation, research interests and training needs of primary care staff interested in participating in North Central Thames Primary Care Research Network	Needs Assessment Questionnaire and Focus groups	82 practices (57 responded to questionnaire – 70%). 2 Focus gps convened with GPs, 1 with practice nurses	Survey respondents keen to be involved with research at different levels. In focus gp discussions GPs saw practice development, education and research as linked; they were interested in projects relevant to their own practice population. Networking issues (support, communication) considered crucial. Practices' research interests (survey): <i>prescribing</i> (61%), <i>cardiovascular disease</i> (58%), <i>primary/secondary care interface</i> (47%). 56% said they had participated in research at some time, but only 3 practices currently had a staff member with committed research time. Greatest barriers to research involve: clinical commitments (83%), associated admin (65%), and finding staff to cover surgeries (63%). Training: need for training on research methods (qual methods 51%, quant methods 46%, evidence based	

					medicine 46%, conducting research (46%).	
(Robinson 2000) *	GPs	To find out more about GPs' stated practices and attitudes towards (undertaking and using) research.	Questionnaire using a combination of open and closed questions covering 8 topics of interest sent to all GP principals in contract with Portsmouth and E Hants Health Authority, and further letter and qu'aire sent to all non responders 6 weeks later.	295 questionnaires – 249 responders (84%)	90% GP responders felt that primary care research was important, while majorities expressed interest in research (61%), using research to directly influence practice (68%), and an interest in undertaking future research (53%). Perceived priorities for future primary care research are chronic illness, primary care organisation, patient behaviour.	

Studies using Research and Development Culture Index Evidence Table

Intervention (what it is, how often it is administered, (brief reference details [Ref ID])	Who the intervention is aimed at.	Aim/ Objective	Research Method/ Design	Findings/Results	Use of Findings	Professional Group (Code)	Sector	Country
(Glacken 2002) Research and development in a Northern Ireland trust. Trinity College, School of Nursing & Midwifery Studies, University of Dublin, Ireland.	All registered nurses in Trust (n = 786).	To ascertain perceived research and development (R&D) capacity of an integrated trust in Northern Ireland.	Cross-sectional survey using Research and Development Culture Index, 18-item, four-point Likert scale which addresses R&D capacity under three headings: context, knowledge/ skills and intent.	Several areas perceived as limiting R&D capacity: lack of support for nurses in changing practice, lack of knowledge of research terminology and how to apply findings to practice. Overwhelming desire to overcome barriers.	Trust responded to findings of survey and introduced number of strategies to counteract the limitations noted, such as the introduction of R&D link nurses trust-wide.			
(Pascoe & McMain 200) Investigating a research culture in primary care: Opportunities, skills and training	16 workshop participants from Meanwood Group Practice, a Level A	To assess research culture in practice at mid point of research practice	Practice organized workshop co-facilitated by research lead and research	A quarter of workshop participants were GPs, with 10 representatives from administration	Both clinical and administrative staff are supportive of the locally initiated and collaborative research conducted in the practice. Our findings support other research which suggests that a poor level of interest in research (Trostle 1992),			

issues.	Research Practice.	tenure and to explore what research process meant for the practice staff.	fellow. Programme involved dissemination of research to date, then using crime scene investigation as analogy, outlined research process. Workshop then assessed research culture in practice by asking staff perceptions about research and administering Research & Development Culture Index (Clarke et al. 1999). Feedback provided through practice based	and practice management, and two practice nurses. Six participants were full time with majority aged 41-50 age. General agreement regarding opportunity to support research and development however many believed training and other needs, related to research and development, needed attention. Similarly, skills in maintaining research and development required support. A few participants wished to develop interest in research, very few detailed topics that held their interest.	represents barriers present in the organisation of primary care (e.g. lack of time) (Good 1992). The workshop has found that the research process remains detached however has engaged staff in an effective way to disseminate research and improve the number of people involved in research.			
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			evaluation form.	Twice as many participants did not wish to learn more about research activity than did.				
(Watson et al. 2005) Exploratory factor analysis of the research and development culture index among qualified nurses.	485 nursing staff.	To present exploratory factor analysis of Research and Development (R&D) Culture Index.	Factor analysis of data using Principal Components Analysis with oblique rotation. Eighteen items were initially included in Index. Pilot instrument distributed to nursing staff within three different types of Trust. Factor analysis resulted in rejection of two items and analysis repeated using remaining 16 items.	Three latent factors accounted for 58.0% of variance in data. Factors were: R&D Support, (perceived support within working environment for R&D activity); Personal R&D Skills and Aptitude, (individual's perception of ability towards R&D activity); and Personal R&D Intention, (individual's willingness to engage in R&D activity). Each factor had good internal reliability, as did overall index.	R&D Culture Index provides an efficient means of assessing the strength of organization's R&D culture in way that captures the role of individual practitioner and organizational environment. Findings suggest that continuing promotion of R&D within health care organizations is dependent upon multi-faceted approach that addresses learning needs of organization as well as those of individual practitioners.			

<p>(Whitford 2005) Developing R&D capacity in a primary care trust: use of the R&D culture index</p>	<p>572 health professionals and staff under auspices of North Tyneside Research PCT.</p>	<p>To assess current level of research activity and capacity for research within a PCT.</p>	<p>Questionnaire, incorporating recently developed and validated research and development culture index,</p>	<p>50.3 per cent response rate. Groups more likely to show increased capacity for research included those with postgraduate qualifications and those in post for least time. GPs less likely than other professional groupings to declare personal skills or aptitude for research. Most important factors thought to contribute towards development of culture of R&D were access to people to support development and changes in professional practice and access to training and development</p>	<p>R&D culture index could be used by other PCTs wishing to define and develop research capacity in primary care.</p>			
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				opportunities. R&D culture index enabled identification of groups that may be more research interested and that could be targeted to increase research capacity.				
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Appendix 3: Prioritisation Process Evidence table

ID & Purpose of Prioritisation process	Who initiated this?	Context and connections in the process.	Process Method/ Design and stakeholders	Transparency of priority decision making	Prof Group	Sector	Country	Notes
(Aapro et al. 2004) Research in the behavioural and social sciences to improve cancer control and care: a strategy for development	European Commission linked to many other organisations	Meeting held under the aegis EU, WHO International Union against Cancer, European Cancer League, Organisation of European Cancer Institutes, and Europeans Cancer research managers Forum and the International Agency for Research on Cancer	Interactive consultation to develop consensus through a series of meetings. The consultation event brought together major disciplines in the field. These meetings had specific objectives and 11 areas in which research might be expected to improve cancer control and treatment were developed		Multi disciplinary	Cancer care	Europe	Paper hardly describes the process of how consensus was reached, nor how the interactive consultation was undertaken, nor how the representatives from the major disciplines were identified. Patients/ service users not included
(Averis & Pearson 2003)	Joanna Briggs Institute.		Literature analysis (systematic reviews) to identify gaps in evidence, and identify research questions to address gaps. The literature was mapped against 22 areas of practice.		3211	Nursing car	Australia	Cannot tell what they mapped the evidence against in order to determine gaps.

(Brown, Dyas, & et al 2006)			Information for priorities developed through a series of Focus groups of service users and community representatives. Cross cutting themes were identified as research priorities.	Constant comparative analysis was used to analyse the data.	Multiple professionals	Primary Care. diabetes	UK	This project worked with ethnic minority groups which were recruited via GP practice lists. Two service user participants were involved in validating the findings
(Browne, Robinson, & Richardson 2002)	European Oncology Nursing Society.	To inform a European-wide cancer nursing strategy.	Delphi Technique consisting of three phases. First phase: open ended questionnaire asking for five important questions relating to oncology nursing distributed at a conference. Phase 2: seven experienced nurses were asked to validate categories of research questions from phase 1. These categories were developed into items in a questionnaire for phase 3. Participants (EONS members who had provided their address at meeting) were asked to rank the items in order of importance.	Research categories were ranked in order of priority.	3211	Cancer care	Europe	Delphi is good for geographically disperse groups.
(Burnette, Morrow-Howell, & Chen 2003)			Delphi study. Panel of 46 gerontological social workers completed three rounds on on-line questionnaires	16/ 49 research topics were identified as top priority, and high or moderate consensus ratings	Social workers	Older Adults services		

(Cooper et al. 1999)	? enthusiasts	The consensus conference was conducted as part of the paralympic congress	Consensus Conference including 30 experts from multiple disciplines (engineering, epidemiology, medicine, nutrition exercise physiology and psychology). Panel members were asked to submit statement before the conference, based on relevant data form the literature. These were presented at the conference to stimulate discussion and debate. Which was recorded and transcribed.	A subcommittee of panellists constructed statement based on discussion and evidence presented. The full panel reviewed and edited final statements.	Multi-disciplinary	Disability and activity research	USA	
(De Vet et al. 2001)			Literature analysis 1. developed an inventory to identify interventions for nine common chronic benign pain disorders. 2. search for systematic reviews and high quality RCTs to identify gaps in evidence. 3. developed a list of gaps and shared these with 4 centres of pain management research, who prioritised the list within each centre, and then with each other	A priority list of systematic reviews and RCTs were developed.	Multi-professional	Pain service		
(Doyle et al. 2005)	The Cochrane Health Promotion and Public Health Field, an entity	Links to a commissioning body which has a remit to increase the	The process was developed to obtain views of potential end users of the reviews Method: 1. development of a taskforce of advisers (The taskforce members were asked to prioritise the list generated in phase three based	multiple professional.	Public Health	Global	Paper comments that many of the current reviews are researcher driven, or 'research' driven based on the

	in the Cochrane Collaboration	number, quality and utility of Cochrane reviews for the Effectiveness of health care interventions.	Stakeholders included researchers and end service users ie public health practitioners) who gave expertise through teleconference , and email . 2. Identification of gaps in the current systematic reviews (through searching electronic databases) and identifying systematic reviews selected by clear criteria for quality. Identified reviews were managed and mapped against WHO World Health Report risk factor categories. 3. Production of a list useful topics for decision making within public health. 4. Prioritisation of nominated topics.5. Commissioning and dissemination of list.	on agreed selection criteria (considering factors such as burden of disease, importance to developing countries, avoidance of duplication and opportunity for action)				numbers of existing trials. Authors suggested that those involved with the process acted in their role as public advocacy. They suggest that the next stage of this process might include wider catchments of stakeholders. Also issues about developing world and industrial countries having differing priorities.
(Fenske et al. 2002)	Process was modelled on the NIOSH National Occupational Research agenda		Data were gathered from representative of producer groups agriculture workforce, healthcare, academia and public agencies to participate in telephone interviews and a day- long workshop .	Twelve priorities were developed around occupational hazards for research	Multiple sectors	Occupational health	USA	
(Fochtman & Hinds 2000)	Paediatric Oncology Group		Delphi Technique . First round was conducted to identify patient concerns in paediatric oncology related	Ten topics were identified at the 2 nd round using statistical	Nursing	Oncology	USA	

			to clinical trials. 87 ideas were generated by this round and were reviewed by an expert panel of nurses and 57 topics were delineated. These were then sent to the POC to score for prioritisation	techniques				
(Halfon et al. 1998)	Association for Health Service Research, other federal agencies and private institutions	The authors suggest that these priorities should influence funded research	1. Multi-professional steering committee asked experts to develop papers around 7 specific topics. 2. Conference. Key stakeholders invited to conference to discuss issues. Workshops were held around each of the 7 topics and participants were invited to take part in discussions. Each participant was asked to vote on priorities. Priorities fed back to whole group	Ranked priorities based on voting of conference participants.	Multi-professional	Health care for children	USA	
(Hawk, Meeker, & Hansen 1997)	US Health and Resources and Services Administration Bureau of Health Professionals & Palmer College of Chiropractic.	Funding body and professional college joint work	1. literature review to develop position papers on 5 areas of practice: basic science, clinical, education, health services and outcome research. 2. Facilitated workshops to develop statements based on topics, and votes taken on the recommendations put forward.	The outcome of the meetings were five position papers, one for each topic. Consensus was not achieved for infrastructure support.	3215	Multiple settings	USA	Results of the voting was not presented. No comments were given about why consensus on infrastructure was not achieved.

			<p>The groups also began a process of consensus in the development of infrastructure needs of the profession, although this was not reported on.</p> <p>Stakeholders were health care professionals, policy makers, chiropractic researchers, practitioners, administrators, and members of the professional organisations.</p>					
<p>(Herbert et al. 1999) Setting the research agenda for complementary therapy and cancer care</p>	<p>Health care providers and researchers who had knowledge about patient-physician communication and knowledge of complementary therapy</p>	<p>Linked day with conference to validate findings with other stakeholders</p>	<p>Background papers sent to participants before a whole day meeting. During the meeting 1. four small task groups met to brainstorm issues 2. Presentations were given by counsellors around patient expectation on these issues. 3. Task groups then revisited the issues identified earlier and modified these based on patient expectation views. 4. Plenary session where the organising committee constructed four themed priorities. 5. these findings were validated by presenting them at larger stakeholder conference.</p> <p>Stakeholders were Health</p>		<p>Multi disciplinary</p>	<p>Cancer care</p>	<p>Canada</p>	<p>Suggested that they used a 'participatory action research methodology' but processes within this are not transparent. They acknowledge that they didn't use key stakeholders in this method: complementary therapists and patients!!</p>

			care providers and researchers who had knowledge about patient-physician communication and knowledge of complementary therapy. Complementary therapists were not included.					
(Kavlock et al. 1996)	Environmental Protection Agency (EPA)	EPA responding to the National Science and Technology Council of R&D strategy. This has direct links to funding.	Workshops to address issue of endocrine disruptors. Experts were invited to join workshops. Group discussions were recorded	Not clear how the statements were developed within the workshops	Multi-disciplinary	Environmental issues and health	USA	
(Kitson et al. 1997)	Professional bodies. Royal College of nursing (RCN) and Centre for Policy in Nursing Research	Help with commissioning of research and advising other funding agencies. Based on a Taskforce recommendations that the profession should have a voice	An expert review group was developed to set priorities 1. Information was collected by interrogating literature and through information from key professional groups. 2. Gaps in knowledge were identified using this information. 3. A working list of topics was developed in the working group using a simulation exercise workshop which comprised of two groups. 4. Priorities were set through identifying consistent themes across the two groups. Seven topics were identified.	Priorities developed within the workshop using the simulation exercise and priorities were developed from consistent themes across the two groups.	3211 3212	Nursing across all sectors	UK	

(Lee et al. 2003) Prioritisation questionnaire adapted from Oncology Nursing Society USA	Specialist Nurses in oncology	No, although authors suggest that funding agencies and researchers focus on supporting the priorities identified	Questionnaire devised by another group of oncology nurses (in USA) and translated into Korean was sent to all of the members of a National Oncology Nursing Society	Five research priority areas were identified based on a weighted score of items (research topics) in the questionnaire	Nurses 3211	Oncology	Korea	Original questionnaire was not developed by nurses. No service user involvement. Response rate= 33.8%.
(Lionis et al. 2004)	European Society of General Practice/ Family Medicine invited the associated network on research, the European General Practice Workshop (EGPRW) to develop research agenda.	The authors suggest that each country should develop national checklist of 'content of' and 'conditions for' research to be undertaken.	Brainstorming session during the EGPRW meeting to look at priorities as well as needs and barriers. The meeting included academic GPs (35), other physicians (4) , social scientists(3) and medical student (1) Six groups in the workshop listed topics and prioritised them, and these were discussed in plenary session. These were subsequently themed by facilitators.	The lists of ideas were themed in to categories by the researchers. These are listed rather than prioritised. Some mention of frequency of topics across all groups is mentioned but not presented as scored priorities.	2211 GPs	Primary Care	Europe	Issues of inclusion and voice not identified. The notion of matching conditions/ barriers to content might be an important one. These should be linked to the priorities set rather than undertaken as an isolated and parallel procedure.
(O'Halloran et al. 1996)	Members of the research committee at a healthcare facility	Part of a participatory learning programme to increase self efficacy and research activity	Delphi technique. The first round of the Delphi was undertaken within the institution, and the second and third rounds were undertaken during the learning event. Stakeholders were nurses	Prioritising process developed through statistical ranking system, with a consolidation of topics in each round.	3211	?secondary care	USA	Significant differences were identified on self efficacy scores pre and post the learning event. High ranking priorities were taken up as research projects

			at the learning event.					
(Remme et al. 2002)	UNDP/ World Bank/ WHO special programme for research and training in Tropic diseases known as the TDR)		Adopted the Global Forum for Health Matrix for priority setting. 7 step approach for each disease group which includes: What is the nature and size of the problem? What is the current disease control strategy? What are the challenges to disease control? What research is needed to address these problems and challenges? What is currently being done? What are TDR's comparative advantages? What should be the research emphasis? For each disease analysis was undertaken by TDRs Disease Research Coordinator in consultation with a reference group (unknown compilation).	Information complied in a matrix for comparison and planning		Tropical disease	International	?? should be included in this table??
(Rosenstock, Olenec, & Wagner 1998)	National Institute for Occupational Safety and Health (NIOSH) instigated this initiative to yield workers for the nations		NIOSH, and its public and private partners developed a master list of topics which were developed and adapted based on input from working groups (which included researchers and health professionals), written comments , and comments made at	Priorities within the working groups were identified. Priorities endorsed by 3 or more of the working groups were included in the NORA.	Multiple professionals.	Occupational Health	USA	

			consultation meetings . These were synthesised by NIOSH to form the National Occupational Research Agenda (NORA), which was further circulated for discussion before being finalised.					
(Ross et al. 2004) Identifying research priorities in nursing and midwifery SDO	National Coordinating Centre for the SDO	National Coordinating Centre for the SDO (research commissioning organisation)	Data were collected in three strands. 1. Focus groups undertaken with service users. 2. Interviews with key stakeholders (health and social care providers, multi-professional groups, policy, management and researchers commissioners, and members from higher education.3. literature analysis . Each method of data collection were analysed separately. Themes from each strand were scrutinised by the research team who looked for patterns, consensus and divergence. Cross cutting themes across the strands were mapped out.	A theoretic framework was developed from content analysis of service user focus groups, and other stakeholder interviews generated from notions of gaps in the service. The priorities were developed from triangulation of three data sources to achieve consensus.	3211 3212	All sectors	UK	The process of research priority setting is a social construction which has mostly been driven by professional agendas. Important to have a user strand for comparison with other stakeholder views. What did they do with differing view points.?
(Rushdy & O'Mahony 1998)	PHLS overview of the Communicable Diseases Committee.	The PHLS used the results to guide a major programme of research.	Questionnaire sent out to senior staff and scientific committees and consultants of communicable disease control. Organisations of		Multi-professional	Communicable disease	USA	

			health professionals were asked their views on the initial findings.					
(Scott et al. 1999)	Professional bodies. Royal College of nursing (RCN) and Centre for Policy in Nursing Research	<p>Help with commissioning of research and advising other funding agencies. Based on a Taskforce recommendations that the profession should have a voice (linked to Kitson et al 1997).</p> <p>As a result of the exercise a strategic alliance for Research in Nursing, midwifery and Health Visiting was developed to provide a united and collective voice in nursing.</p>	<p>The paper describes the overall priority setting exercise for nursing. Linked Kitson et al 1997</p> <p>Priority setting groups were developed for each of 4 themed areas. Each group had a chairperson, a secretary, and 25 people from a range of backgrounds including research, practice, education, and management, with an expertise in the themed area.</p> <p>Each group met twice over a three month period.</p> <p>Meeting one: a list of areas were identified to explore the literature that exists through developing a simulation exercise. Information gathering was undertaken outside the group led by review coordinators.</p> <p>Meeting two: review coordinators were asked to present review and identify a list of priorities. The</p>	<p>The initial four general themes leading to priority setting groups were identified based on criteria relating to centrality to nursing practice, and inclusively to the diversity of the nursing profession.</p> <p>The process of setting priorities is described, Participants were asked to consider topics and rank against 4 key criteria: how the topic would address a gap; how it would contribute to knowledge and practice on clinical and cost effectiveness, prevalence of the problem, potential for the topic to develop 'blue skies' However the</p>	3211 3212	Nursing across all sectors	UK	Highlighted issues about including user perspectives in priority setting.

			groups were then asked to consider the priorities and rank them..	development of priorities is illustrated with data.				
(Smith et al. 2005)	The national Coordinating Centre for SDO R&D Nursing & Midwifery subgroup.	Service user views were part of a multi-method approach to developing priorities in the SDO commissioning process. (See Ross et al)	Service user expectations were identified through a series of Focus Groups . Service user representation recruited from Community Health Councils. Discussion focussed on: gaps in services, priority areas for improvement and ways of developing service users in these developments. A discussion around prioritisation of themes was developed at the end of the session.	Framework analysis of the focus group content was undertaken by the research team and fed back to participants. This is linked to the larger study (see Ross et al 2004)	3211	All sectors	UK	They agreed that verification of priorities could have happened at a 2 nd stage. Used this as a framework against which literature and practitioners priorities were organised (see Ross et al 2004)
(Thorncroft et al. 2002) Creating an infrastructure for mental health research		This was conducted in response to key policy initiatives: NSF mental health, NHS plan to identify gaps in research coverage	Three sets of source documents were reviewed by the review panel and used to compile the gaps in research coverage: 1. A thematic review conducted by the team on behalf of the DH of research in relation to the NSF-MH; 2. A scoping review of effectiveness of mental health services 3. The report of the MH Topic working Group which reported to a national R&D review committee	11 recommendations were developed based in these source materials				? should this be in the table; does it satisfy the interpretative assessment approach (by the review panel??)
(Tighe &		Stakeholders	A series of meetings with		Multipl	Rehabilit	Canad	

Biersdorff 1993)		hope to continue their involvement as the research progresses	stakeholders to identify priority topics, preferred methodologies, and preferred dissemination strategies. Stakeholders include practitioners, parents, advocates and consumers of services		e professionals	ation community	a	
(Vella et al. 2000)	R&D Directorate of West Midlands	Authors encourage researchers to develop ideas around the priorities, and to use this as leverage when applying for funding. Advise funders to use results to influence commissioning	1. Initial topics identified through contact with clinical directors and nurse managers of each adult intensive care unit in UK (n= 325). 2. 100 most frequently cited topics were included in the 2 nd stage of the Nominal Group Technique (NGT) . NGT stakeholders included professionals (doctors and nurses of varying seniority), covering geographical spread and hospital status (teaching vs non-teaching)	Prioritising process developed through statistical ranking.	3211 2211	Critical care	UK	Can be an expensive process. Authors estimate that £10,000 (£5,000 for time of clinicians)
(Whitford et al. 2000)	? research teams	The priority setting exercise done in the context of education and by research practices, and to inform their	1. Educative away day to brainstorm practice problems and convert to research questions. 2. Log diary of problems in practice over one month.3. Research steering group selected identified	Research questions were scored and these were summated for the group.	3211 2211 1183	Primary care	UK	Interesting action element to this project. should link to other RCD interventions! Projects are underway based on the priorities.

		activity in research. 'several' projects are reported to be conducted based on the exercise	problems that could be considered research questions. 4. List of research fed back to practices and research questions clarified . 5. Questions were scored by participants.					
(Yin et al. 2000)		Authors comment that National Science Council will find this information helpful.	Idea writing technique. Groups of nurses wrote down ideas of important research topics for nurses considering the issues of: understanding health needs and problems, feasibility of doing the research.	Written ideas collated under headings of practice, education and management issues. Unit of analysis was frequency of written idea by respondents.	3211 nursing	Multiple settings	China	

Appendix4 : Mentoring Evidence Table

Intervention (what it is, how often it is administered , (brief reference details [Ref ID])	Who the intervention is aimed at.	Other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country
(Baldwin 2002) * Employment of part-time writing coach	Nursing faculty (16 out of 26 worked with coach)	None	Framework of coaching and support to meet faculty writing needs. Comparison of faculty publication rates before with and without coaching.	Research productivity	During the coach's 1 st 2.5 yrs (Apr 97 – Oct 99) 16 of 26 faculty sought her services, and submitted 21 manuscripts to peer-reviewed journals of which 15 (71%) have been published/accepted. Most faculty who were coached (13 of 16) published more than or the same as the previous 4 years, but comparison of faculty output before and after working with the coach is confounded by several factors.	Nursing	Academic	US
(Benson 2002)	Academic faculty members		Mentoring programmes, voluntary participation, selection of senior faculty members by junior members	To find out if voluntary mentoring programme could be established with minimal resources and be effective in context of major institutional reorganisation	Faculty indicated prog had a positive impact on their professional life and increased productivity. High satisfaction with mentoring relationship and trend towards increased retention of minority faculty.	2211	Academic	US
(Butler 1989) Mentoring and	309 female faculty members	None	Survey	Research productivity	Mentorship for academic roles occurred in 55.7% of cases. Mentoring was significantly related to	Nursing	Academic	U.S.

Scholarly Productivity in Nursing Faculty. Unpublished doctoral dissertation,	with doctorates employed in graduate nursing programs.				research productivity. Direct correlation between length of mentoring relationship and protégé's productivity.			
(Clark 1994) Mentoring Relationship of Men into Academic Role in Nursing Programs.	114 male nursing faculty	None	Survey	Scholarly productivity	Men who had been mentored did not differ significantly from men who had not been mentored with respect to their rate of scholarly productivity. The type of mentoring reported in this study was social mentoring which did not directly influence research productivity.	Nursing	Academic	U.S.
(Cumbie 2005) * Writing support group established to facilitate faculty scholarly productivity	Nursing faculty	None	Group development	Scholarly productivity	Ongoing support and mentoring led to significant writing outcomes in the form of manuscripts submitted for publication, abstracts for conference presentation, grant proposals developed, collegial relationships formed	3211	Academic	US
(Curtis 1992) Family Medicine	Primary Care Fellows with at least one year of training		Postal questionnaire (27 of 32 eligible fellows returned the survey)	Evaluation of 10 NRSA Primary Care Fellowship Programs	All programs emphasised research and gave mentorship explicit attention. Fellows reported a median of 3 research projects during the fellowship; 60% had extramural funding; 48% submitted manuscripts for publication; 22% had work accepted for publication. In open ended responses they emphasised the importance of mentors' guidance	3211	Academic	US

					on projects, accessibility and emotional support (rarely did they mention help in establishing professional networks or in securing project funding)			
(Curtis 2003) * Research training program	146 NRSA graduate fellows (National Research Service Awards) 1988-1997	None	Survey (questionnaire)	Career paths of family medicine graduates	Family physician graduates of this research training program did not achieve academic success comparable with their peers. Only 12.5% of family physician fellowship grads published 1 or more articles per year, compared with 36.5% of their peers. 30% had published nothing since graduation	2211		US
(Donaldson 1996)* Survey	51 former and current senior public health medicine trainees (38 responses – 75%)		Survey (qu'aire)	To assess extent to which investigative work carried out during training in public health medicine was formally disseminated in peer-reviewed journals	30% had no publications arising from any work undertaken during training, and specifically 49% had no publications arising from submissions made for the part II examination for membership of the Faculty of Public Health Medicine. 30% had no publications from any training period work; 43% published between 1 and 3 papers. The mean number of publications per trainee was 2.0. 37% achieved publications from work undertaken during their first consultant post. Perceived barriers to publication were: lack of priority accorded to publication by training dept.; lack of time and lack of supervisor or mentor to facilitate preparation of material.	Medical 2211	Academic	UK
(Dutta 2000) *	16 surgeons (survey)	None	Literature review to create	Research productivity	Top 3 factors in surgical education research success (publication) were	Medical 2211	Academic	US

Search of medical education articles from 1980-98 to identify surgeons contributing most research pubs	questionnaires sent to top 10)		list; survey (qu'aire)	(Educational research)	1. Chair support 2. collaboration with peers and mentors 3. participation in the Association for Surgical Education Top 3 barriers were 1. perception at their institution of educational research as lacking credibility 2. lack of adequate funding 3. lack of time. 85% reported having tenure or equivalent, of which 45% reported educational research as playing a significant role.			
(El-Guebaly & Atkinson 1996)	Academic faculty		Survey: questionnaire of target population of 2484 incl 522 full-time faculty	To assess research training and productivity of academic faculty in Canadian Depts of Psychiatry and to compare findings with US colleagues	Overall more similarities than differences in research interests with colleagues in US. Pharmaceutical industry most frequently mentioned source of research funding for MDs; availability of <i>mentor</i> perceived as the most influential determining choice of research career.	2212	Academic	Canada
(Giveon, Kahan, & Kitai 1997) Factors associated with family physicians' involvement in research in Israel.	Random sample of 200 family medicine physicians and residents (from approx. 600) employed by largest HMO in Israel.	None	Questionnaire containing items on demographic variables, research attitudes, and academic and research activities in primary care settings	Knowledge of and involvement in research	190 physicians responded, for a response rate of 95%. Based on their responses, the respondents were divided into four groups by amount of research involvement. Univariate analysis using the chi-square test was used for the comparison of variables among the four groups. Respondents reporting greater knowledge of and involvement in research had had, while in residency training a mentor who encouraged involvement in research ($p = .0001$).	Medical	Primary Care	Israel
(Hillman et al. 1989)	Members of the Association		Survey of 1400 members	Research productivity (to evaluate the	Highest research productivity in academic practice associated with attending medical school, obtaining	3214	Academic	US

	of University Radiologists			influences related to background, education , training, attitudes etc)	radiology training, and practicing at an institution among the 20 with the highest amount of research funding. Men published research more frequently than women.			
(Jackson 2003)	Academic medicine faculty members		Telephone interviews of 16 faculty members	To develop deeper understanding of mentoring by exploring lived experiences of academic medicine faculty members	Almost 98% of participants identified lack of mentoring as the first (42%) or second (56%) most important factor hindering career progress. Effective mentoring needs appropriate interpersonal match.	2211	Academic	US
(Lampman 2003) * Training programme in a community hospital to enhance scientific methods	Surgical residents		(Creation of Research curriculum and infrastructure)	Research productivity	Research productivity has been prolific. Since inception of formal research curriculum Residents presented 166 abstracts; 59 articles in scientific journals, 4 book chapters, 44 research awards. Faculty research also productive	2211	(Community) Hospital	US
(Leibenluft 1993) * Survey into influence of gender on the careers of academic psychiatrists	Psychiatrists (full time, salaried, doctoral level faculty)	None	Survey (questionnaire)	Gender differences in <u>research activities</u> and <u>rank attainment</u> among psychiatrists	Men more likely than women to have had research training, to have ever been principal investigators on peer-reviewed grants, to mentor research trainees, to be currently involved in research activities. Many gender differences remained significant after controlling for seniority and research training. In every cohort men had attained higher academic rank than the women. In general, differences in research activity and productivity most marked in youngest cohort.	Psychiatry (2211?)	Academic	US

(Levinson et al. 1991)	558 fulltime medical faculty women, aged <=50, in U.S.	Role models	Descriptive survey [Non-interventional]	Publications; Time spent on research activity; Career satisfaction.	Those with mentor during training averaged 13.1 publications compared with 10.3 articles for those without a mentor (P < .05). Women with mentor estimated they spend an average of 26% and those without a mentor spend 21% of their time doing research (P < .01). Significant association between having a mentor of either sex during training and the respondent's race, number of publications, time spent on research, and overall career satisfaction. White respondents were significantly more likely than non-white respondents to report having a mentor during training (63% vs 49%, P<.05). Sex of mentor was not significant influence on either number of publications or percentage of time spent on research.	Medical	Academic	U.S.
(Luckhaupt 2005) * Survey of mentors	111 mentors	None	Survey	Trends in mentorship in General Internal Medicine. Experiences with mentoring incl compensation for mentoring, multiple mentees, comentorship, long distance mentorship	Of 111, 52 received funding for mentorship. Mentors supervised a median of 5 mentees each; Compared with mentors without funding , mentors with funding had more current mentees (mean of 8.3 vs 5.1 P<.001). Full professors had more current mentees than associate or assistant professors (8.0 vs 5.9 vs 3.4 respectively; P=.005). 94 (85%) had experience comentoring. <u>Conclusions:</u> Mentors in GIM appear to be close to their mentorship capacity, and the majority lack funding for mentorship. Co-mentoring and long distance	Medical 2211	Academic	US

					mentoring are common.			
(Mills 1995)	Family Practice residencies		Postal survey (154 completed surveys received; response rate of 68%)	To describe residency research productivity and identify independent factors that best characterize programs at various levels of productivity	22% of programs had high productivity; 46% medium productivity; 32% low productivity. Significant factors: <i>mentor</i> support, amount of research activity, program size; these contributed independently to the classification of programs by relative level of research productivity	3211	Family Practice	US
(Morzinski 2003)* Faculty development programme (FDP)	30 full-time FDP completers	None	Longitudinal (10 yrs) multi-method study. Instruments and analysis used Kirkpatrick's Evaluation Model	Competence, leadership, scholarly productivity and retention in academic medicine	80% attendance and high prog satisfaction. Learning outcomes: positive pre- to post- program changes. Behaviour changes: pre- to post-prog tripling of institutional leadership positions. Yearly group averages of peer-reviewed publications increased from 7 before to 26 after. 80% of participants retained in academic careers 2 yrs post programme	2211	Academic	US
(Mundt 2001) * Faculty Development Program (using external mentors)	Nurse scholars	None		Research productivity	Since start of program all mentored faculty have submitted one or more grant proposals. 33 extramural proposals submitted by mentored faculty over 2.5 yr period: level of productivity significantly increased over baseline year before initiation of program	Nursing	Academic	US
(Nierenberg & Carney 2004) * Description of the development of DMS'	Dartmouth Medical School		Report	Research productivity	Measures of academic and research Productivity identified by the Office for Community Based Education and Research, DMS (2000-3): increase to 77% for grants actually funded; no of manuscripts per yr submitted has risen from 4 in 2000-1 to between 15	2211	Academic	US

infrastructure for supporting educational research					and 20 in 2002-3 (86% success rate); abstracts submitted for presentation at national meetings: 90% success rate			
(Olson & Connelly 1995) * 1 yr pre-doctoral fellowship project	Nursing students (actually 4 mentor-protégé pairs)	None	Descriptive survey using semi structured interviews, and a written questionnaire based on Yoder model	Develop research skills	Investment in fellowship worthwhile. Experience of 4 pairs of mentor faculty and protégé doctoral students perceived as beneficial to all. Protégés believed that their experiences with application of statistics, management of large data sets, and grant management were enhanced.	Nursing	Academic	US
(Paul et al. 2002)	350 randomly selected occupational therapy faculty across the United States.	None	Questionnaire survey	Research productivity	One hundred twenty seven surveys were completed (36%) which included 35 senior faculty and 92 junior faculty members. Among senior faculty 27 reported acting as mentors and eight were nonmentors. Of junior faculty, 48 were protégé's and 44 had not been mentored. Results of the survey indicate positive effect of mentoring on research productivity among junior faculty in occupational therapy. The majority of junior faculty members in occupational therapy had master's level education and thus used mentor to guide them in the research process. Average duration of mentoring relationship was 3.5 years.	Allied Health	Academic	U.S
(Pololi 2002)	Junior Medical school faculty		Evaluation using quantitative and qualitative	To facilitate faculty in career development using collaborative	Evaluation data highlighted the critical nature of a supportive learning environment and reasons participants chose to attend program consistently.	2211	Academic	US

			methods	mentoring based on Rogerian and adult learning principles	Participants developed keen sense of personal transformation and empowerment.			
(Pololi 2004) al *	18 assistant professors		Collaborative Mentoring Program (CMP) and analysis of qualitative data. Project evaluation using open ended questions	Scholarly productivity	CMP conducted twice. Analysis showed programme facilitated the knowledge, skills and support needed to foster writing productivity. All participants completed at least 1 manuscript by end of CMP. Initial cohort of participants submitted 16 manuscripts for publication; 2 nd cohort 11	Medical	Academic	US
(Ramondetta & et al 2003) Mentorship and productivity among gynecologic oncology fellows	Gynecologic oncology fellows	None	Survey questions identified demographics, mentorship status, productivity, career plans, and opinions in fourth fellowship year.	Expectation for completing one's thesis	Two thirds identified a clinical or basic science mentor. There was an association between having a research mentor and expectation for completing one's thesis (p = 0.002).	Medical	Academic	U.S.
(Roberts 1997)	Full time nurse academics		Survey of 65% of 1,107 nurse academics	Scholarly productivity incl factors constraining and facilitating publication	Overall academics had low level of scholarly productivity and scholarship of ¼ of those who had published in the year prior to survey was not rated highly by university value system. Constraints: teaching commitments, need to improve academic quals. Facilitated by: mentoring, professional development leave, participating in research.	3211	Academic	Australia
(Rogers,	Family	None	Literature	Research	Describes components of mentoring	2211	Academic	US

Holloway, & Miller 1990) *	Medicine faculty		review	productivity	process and proposes Guidelines for junior and senior faculty and department chairs who choose to use mentorship as a means of achieving the personal and/or organisational goal of optimal research capacity			
Review of faculty development strategies								
(Rust 2006) *	'Underrepresented minority faculty' – 113 participants from 1992-2003 (92% African-American, Afro-Caribbean, African)	None	Program development; Outreach/enrolment; Participant evaluations		Little scientific evidence (anecdotal only) of cause and effect relationship between faculty development program and career choice, scholarly productivity or career trajectory of minority faculty. But the number of African American full time family physician faculty at US medical schools has more than tripled (from 52 to 169 during 1 st 10 yrs of programme.	Medical 2211	Academic	US
Faculty development programme								
(Sciscione 1998) *	138 Maternal-fetal medicine fellows (98.5% return rate)	None	Survey	Satisfaction with programme; also to ascertain division of time between clinical and research activity	A mentor or faculty advisor plays significant role in training of maternal-fetal medicine fellows and is associated with higher incidence of satisfaction with fellowship program, thesis completion, and entrance into academic practice. eg mentor increased likelihood of thesis completion from 52.3% to 83.5%; (P<.001). Fellows with a mentor (88.2% v 55.8%; P<.001) were more likely to recommend their fellowship. Fellow's desire to enter academic practice was associated with mentor's presence (41.8% v 21.5% , P=.014)	Medical 2211	Academic	US
Survey re fellowship satisfaction								

(Sciscione 2004)	Maternal-Fetal Medicine fellows		Survey (Return rate 65%)	To investigate whether changes (lengthening prog and more stringent req'ments for protected research performance) imposed in Fellowships in 1997 have improved fellow experience	Overall improvement in many areas of fellow experience: an increase in research time (7 to 18 mths / $P < .001$); number of research projects ((2.9 to 4.3 projects/fellow $P < .001$); fellows rating research time adequate (66.4% to 85.6% $P = .003$); pursuit of postgraduate degrees (5.7% to 32.9% $P < .001$); presence of a <i>mentor</i> (68.1% to 80.8% $P = .049$); rating of <i>mentorship</i> as strong (59.4% to 77.9% $P = .039$)	2211	Academic	US
(Shapiro et al. 1994) * Study of first year medical students and family medicine faculty preceptors	11 first year medical students and their 10 faculty mentors	None	Questionnaire/interviews of 11 1 st yr medical students and their 10 faculty mentors	Research activity (motivation to engage in)	Findings included identification of a core of theme or meaning that motivated participation in the project for students and faculty. This theme was expressed in terms of professional, personal, relational and societal goals. Study identified 3 interrelated mechanisms (socialisation, relationship, and technical skill transmission) used in varying degrees by students and faculty to achieve these goals	2211	Academic	US
(Steiner et al. 2002) Indicators of Early Research Productivity Among Primary Care Fellows	1988–1997 graduates of 25 National Research Service Award primary care research fellowships in the United	None	Mail survey in 1998.	Publishing 1 or more papers per year since beginning of fellowship, or serving as principal investigator (PI) on a federal or non-federal grant.	146 of 215 program graduates (68%) completed survey. Median age was 38 years. 51% were male. 32% had published 1 or more papers per year, and 44% were PIs. Male gender (odds ratio [OR], 3.6; 95% confidence interval [95% CI], 1.4 to 9.2), self-reported allocation of 40% or more of fellowship time to research (OR, 4.4; 95% CI, 1.8 to 11.2), and having influential mentor during fellowship			

	States.				(OR, 5.0; 95% CI, 1.5 to 17.2) were independently associated with publishing 1 or more papers per year. Fellows funded as PIs more likely to have influential mentor (OR, 3.0; 95% CI, 1.3 to 7.2).			
(Steiner et al. 2004)	215 fellows graduating from awards for primary care research programmes .	None	Descriptive survey [Non-interventional]	Time conducting research, publishing papers, being the principal investigator on a grant, providing research mentorship to others	139 fellows (65%) responded a median of four years after fellowship. Thirty-seven fellows (26.6%) did not have an influential mentor, 42 (30.2%) reported influential but not sustained mentorship, and 60 (43.2%) had influential and sustained mentorship. Individuals with influential mentorship spent more time conducting research ($p=.007$), published more papers ($p=.003$), were more likely to be the principal investigator on a grant ($p=.008$), and more often provided research mentorship to others (72.5% versus 66.7% of those with unsustained mentorship, and 36.4% of those with no influential mentor, $p=.008$). After controlling for other predictors, influential and sustained mentorship remained important determinant of career development in research.	Medical	Academic	U.S.
(Weston et al. 2006) [Internet abstract] http://www.pocris.org.au/conference/2		Guiding principle of Flinders University PHC RED capacity building		Bursaries and writing grants were awarded to PHC practitioners through SARNet (South Australian Research Network	Over a 26-month period, from 2003 to 2005, 25 bursaries and 10 writing grants were awarded. Four PHC RED staff with over 60 combined years of research experience each mentored 8–9 grant holders. External mentors provided expert advice on statistics		Primary Care	Aus

005/presentations/thursday/weston.pdf		model is to support practitioners through mentoring.		for Primary Health Care). Designated mentors assigned to each recipient, providing continuity of advice and support.	and consumer issues. Mentors provided advice and direction in research planning, study design and methodology, data analysis, and in writing abstracts for conferences and presentations, manuscripts, theses, reports, and reviews, through face-to-face meetings and via email. Fourteen bursary projects and 5 writing grants have been completed.			
(Williams & Blackburn 1988)	183 junior and senior faculty nurses (97.8 % women)	None		Research oriented productivity	Mentoring is multidimensional phenomenon. Identified four types of mentorships: role-specific modeling/teaching, encouraging the dream, organizational socialization and advocate. Only role specific modeling/teaching predicted research-oriented productivity among mentees.	Nursing	Academic	U.S.

Appendix 5: Research leadership Evidence table

(* = full text)

Intervention (what it is, how often it is administered, (brief reference details [Ref ID])	Who the intervention is aimed at.	Other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country
(Barhyte 1993) Scholarly productivity measured	Graduate nursing faculty (information provided by 180 nursing deans of schools with graduate (masters and doctoral) programs)	None	Productivity calculated in 3 ways and scores derived from 9 categories of faculty scholarly activities	Scholarly productivity. Total income (net), publications, and grants.	Following examined for contribution to productivity: 3 measures of environmental support, budgeted and doctorally prepared faculty, students (master's, doctoral), all graduate students-faculty ratio, scholarship time, and private faculty offices. The regressions of log-transformed variables yielded R2=.59 for total (net) productivity, .54 for publications, and .50 for grants productivity	Nursing	Academic	US
(Bland 2005) Study of the effectiveness of Bland model	Medical faculty. University of Minnesota Medical School-	None	Study used data from Uni of Minnesota Medical School-Twin Cities vitality survey that had response rate of 76% (n=465 faculty). Statistical	Ability of Bland model to predict (individual and group/ departmental) <u>research productivity</u>	Validity of faculty, department and leadership characteristics identified in the Bland et al (2002) model were confirmed as necessary for high levels of research productivity. Faculty productivity was influenced more by individual and institutional characteristics; group productivity was more affected by institutional and leadership characteristics. The characteristics and groupings in the Bland model predict faculty research	2211	Academic	US

			software used to conduct tests, logistical regressions, and multiple regressions on these data		productivity.			
(Blanda, Gerson, & Dunn 1999) Emergency medicine resident research requirements and director characteristics.	Emergency medicine (EM) residency program	None		Type of research productivity, time spent, and compensation	One hundred of 111 (90%) RDs responded; 54 of 100 respondents from university programs. Research is formal requirement in 80% of EM programs. Writing manuscript (35%) and major involvement in project (31%) are most common minimum requirements. University and community programs had similar research requirements and were equally likely to have delayed/withheld certificates. 86% of RDs were male; 70% held this position for <5 years and 70% plan on being in position for <5 additional years. More than half were junior faculty and 21 had completed a fellowship. 88% did not serve in associate RD position, and currently only 20 programs reported having this position. 54% percent had protected time. Median hour/week time allocations are: clinical-22, own research--10, other people's research--6, administration--5, and department administration--5. Factors associated with research productivity			

					<p>were senior rank (OR 6.87), having research assistant (OR 4.78), protected time for own research (OR 3.06), and reporting that extramural funding was considered in RD's performance evaluation (OR 2.69). Most RDs are junior faculty, have limited research training, expect short tenure in position, and have variable access to research resources. To foster research environment requires that all RDs have protected time, and a greater proportion at associate or full professor level, have qualified research assistants, and receive periodic evaluation reviewing their ability to generate external funds. Appointment of associate RDs may improve research training and help ensure qualified RDs.</p>			
(Bolton et al. 2005)	Leaders of California labor and delivery units reporting more than 50 deliveries during 2002	Recruitment methodology involved introductory letters, follow-up contacts, and personal encouragement from senior regional leaders and nurse executives.		Participation in research; Number of contacts made	<p>Nurse leaders asked to participate in structured interview about staffing and clinical policies on their unit. Of 268 eligible hospitals, 225 (84%) participated in study. 54% (n = 114) of structured interviews scheduled upon initial and second contacts by the research coordinator, and 73% (n = 161) completed at first appointment. Unit managers or directors personally completed 91% (n = 205) of interviews, with 20 (8.9%) designated to staff nurse. Nurse leader participation essential to success of research dependent on collecting information regarding nurse</p>	Hospital	Nursing	

					practices and clinical processes. Using multilevel approach to engage nurse leaders in research, such as endorsements and "detailing" by opinion leaders, phone calls, e-mail, and incentives, is effective.			
(Chen 2005)* Study of nursing faculty job satisfaction	Nursing faculty	None	Descriptive, correlational, and cross-sectional study conducted with self administered questionnaire Sample from 18 nursing programmes; 286 questionnaires.	To examine nursing faculty job satisfaction and their perceptions of nursing deans' leadership styles; to understand how well perceptions of leadership styles relate to the levels of faculty job satisfaction in Taiwan	Faculty perceived that Taiwan's nursing deans and directors showed more transformational leadership. Taiwan's nursing faculty were moderately satisfied in their jobs and were more satisfied with deans or directors who practised the transactional leadership style of contingent reward and transformational style of individualized consideration.	3211	Academic	Taiwan
(DeHaven, Wilson, & O'Connor-Kettlestrings 1998) Creating a research culture: what we can learn from residencies that are successful in research.	Family practice residency program directors	None		Completion of research project, interest in practice based research	Three-stage investigation (May 1996) consisting of 1) telephone survey of family practice residency program directors, 2) mail survey of recent graduates from relatively successful programs identified in stage 1, and 3) in-depth interviews with program directors or research directors identified by combining data from first two stages. Most residents in stage 2 completed a research project (68.7%) and currently have interest in practice-based research (57.2%).			

					Residents from programs selected for study's final stage more likely to have published a research article (32% versus 20.3%) and to have completed a project while a resident (81% versus 60.1%) than those from programs not selected. Virtually unanimous characteristics of successful programs include program director support of research, time for research, faculty involvement, a research curriculum, professional support, and opportunities for presenting research. Individual family practice residencies can be considered at one of three levels; 1) relatively undeveloped, 2) developing, or 3) relatively developed. Programs can expect successful results if they make research a priority. Means are needed to communicate successful strategies between programs.			
(Durning et al. 2004) Comparative review	Internal medical residents within institution	None	10 year study (1992-2001) reviewing number of presentations and publications, using historical control (before/after RRD position)	To determine the impact of a Resident Research Director on <u>scholarly productivity</u> Number of presentations and publications	Significant increase in the number of regional and national presentations as well as publications after instituting the RRD position	2211	Medical	US

(Fischer & Cation 2005)	Residents in a community-based internal medicine residency program.	Resident research director [leader], research elective, cost reimbursement, and research requirement		Research activity, faculty involvement, and institutional cost	Annual number of research submissions increased from 0 to 39 over 6 years. Greatest increase in number of research submissions followed the dual implementation of cost reimbursement and research requirement interventions. Annual number of faculty coauthors rose from 0 to 24 in 6 years. Average cost per accepted project was US 1,023.00 dollars. Strategy was associated with marked increase in resident research activity and faculty involvement. Cost of supporting resident research activity is significant.	Medical	Hospital	
(Flaskerud 2000) Description of the development of leadership through scholarship	UCLA School of Nursing	None	Descriptive	Development of leadership at the UCLA school of Nursing through scholarship in health-related problems of vulnerable populations	Development of leadership and excellence in an area of nursing scholarship depends on interactions between practice, research, theory and education	3211	Academic	US
(Graffy & Stubbs 2005) * Survey of practice managers' role in primary care research	Practice managers	None	Questionnaire and telephone reminders (232 responses – 45%)	To investigate role of practice managers in primary care research in East London and Essex; describe their attitude to research; identify	145 (62%) reported some involvement in research; of these 90 had carried out research in their capacity as practice managers, 42 as part of a degree course, and 7 employed as researcher. 69% of practices had participated in research, and although 2/3 of these considered that few additional demands were made, 32%	1183	General Practice	UK

				their research skills and training needs; contribute to a strategy to develop the role of the manager in R&D	perceived the extra workload as disruptive. Generally positive attitude to research with 2/3 finding it interesting, 35-40% regarding it as part of their role. 49% responded positively to training in research.			
(Greenfield 1985) Review of existing research	Illinois School Departmental heads	None	Review	The role of the department head and the function of the department within the school structure	Sees head's role as providing leadership aimed at developing and implementing practices and policies intended to make the department's instructional programme more effective. Guidelines for effective leadership		Academic	US
(Hepburn et al. 2003) Increasing resident research in a military internal medicine program.	Internal medicine residents from military medicine training program	(1) mandatory research project, (2) 2 months dedicated research time, (3) appointment of research director , (4) lectures on critical appraisal and research design, (5) technical support, (6) faculty mentoring, (7) research meeting and competition involving five		1. Research presentations, 2. Manuscripts accepted for publication in peer reviewed journals	From 1994-1999, house staff had 134 research presentations and 21 manuscripts accepted for publication in peer-reviewed journals. Ninety percent of residents presented at least one project at scientific meeting by completion of training between 1996-1999. Resident scholarly activity significantly enhanced by structured research program, an opportunity to present at a scientific meeting, and award recognition.	Military	Medicine	

		residency programs, and (8) achievement awards.						
(Kohlenberg 1992) Study of relationship between faculty research productivity and organizational structure	300 Nursing faculty teaching in 60 master's and doctoral nursing schools.	None	Questionnaire. Random sample using Wakefield-Fisher's Adapted Scholarly Productivity Index and Hall's Organizational Inventory.	To identify relationship between faculty research productivity and organizational structure in schools of nursing in United States.	Overall relationship between faculty research productivity and organizational structure in schools of nursing was not significant at the .002 level of confidence. Although statistically significant relationships were not identified, scholarly research productivity and its subscale prepublication and research activities tended to vary positively with procedural specifications in highly bureaucratic organizational structure.	3211	Academic	US
(Lucas 1986) Study of relationship between leadership behaviours and organisational variables	170 Nursing deans in baccalaureate and higher degree nursing programs in the United States.	None	Leadership Behavior Description Questionnaire on self-perceived leadership.	To investigate relationship between leadership behaviours of nursing deans and selected organisational variables in baccalaureate and higher degree nursing programmes	Significant relationship found between the leadership dimension of Consideration and faculty expertise. Significant relationships were also found between the dimension of Initiating Structure and the nursing program variables of faculty expertise and educational task and the parent institution variables of control, educational task, and size	Nursing	Academic	US
(McNeal 2003) Study of various elements of faculty satisfaction of African	African American women nurse faculty	None	Survey	Relationship between satisfaction with institution's organizational culture and scholarly	Majority of African American nurse faculty tended not to hold senior professorial rank, admin positions or tenure status. Higher percentage of faculty reported holding deanships or programme coordinator positions and held significantly more leadership	3211	Academic	US

American nurses				productivity of African American women nurse faculty at historically black univs and colleges and predominantly white.	positions in professional nursing organisations. Predominantly White respondents tended to be significantly less satisfied with leadership, environment and socialization than Historically Black counterparts			
(Mitchell & Jones 2006) * Description of problems / strategies in coordinating a research project	Nurse researchers in Oncology Centre	None	Description of project using examples	To explore problems of leading/ coordinating research project in which 9 nurse researchers collect and analyze data	Support systems imperative to welfare of the project team; anticipating practical problems helps develop coping strategies; leadership involved provision of education. Useful to appoint project co-ordinator responsible for day-to-day planning, working alongside project lead	Nursing		UK
(Rogers 1989) Study on deans' leadership styles	36 Assistant/ associate deans in collegiate schools of nursing	None	Ohio State Leadership Behavior Description Questionnaire, and the Fiedler Position Power Scale	To discover whether there were differences in perceptions of deans, assistant deans and faculty of leadership styles, initiating structure and consideration, and position power of assistant/associate deans in collegiate schools of nursing	Significant difference between the 3 groups' perceptions of initiating structure, consideration, and position power. A main effect for initiating structure was found in the deans' perceptions of position power. A main effect was found in perception of the faculty sampled	Nursing	Academic	US
(Shieh 2001) * Study of influence of nursing deans' leadership	Nursing faculty on baccalaureate and associate	None	Cross sectional survey; sample of 233 nursing	To examine influence of nursing dean/director leadership styles on nursing faculty	Idealized influence, intellectual stimulation, and contingent reward leadership styles significantly and positively predicted job satisfaction	3211	Academic	Taiwan

styles on job satisfaction	degree nursing programs		faculty participated	job satisfaction				
(Wakefield-Fisher 1987)	Nursing faculty	None		Relationship between professionalization of nursing faculty, leadership styles of deans and scholarly productivity		3211	Academic	
(Wakefield-Fisher & Frank 1989) Research on nursing faculty and deans	Nursing faculty	None		Relationship between administrative leadership and faculty scholarship		3211	Academic	
(Womack 1996) * Leadership styles and scholarly productivity correlated	106 nursing department chairpersons (from National League for Nursing-accredited baccalaureate and higher-degree progs in 10 mid-west. states)	None	Questionnaire and follow up reminder. Scholarly Productivity Index (SPI) to measure involvement in prepublication and research, publication, editorial, and other scholarly activities. Hersey and	Leadership styles, range and adaptability of nursing department chairpersons; and their involvement in prepublication and research, publication, etc	63% of chairpersons perceived themselves as having a 'participating' leadership style, 36% as having a 'selling' style; secondary/backup styles: 50% selling, 30% participating. Leadership flexibility: 66% saw themselves as moderately flexible, 30% as highly. Significant differences in styles relating to time as chairperson were found: those in position for less than 5 yrs tended to have a participating style. Chairpersons from public nursing schools reported significantly greater numbers of scholarly activities than private. 56% chairpersons reported a great deal of institutional pressure to publish; 22% did not feel such	3211	Academic	US

			Blanchard's Situational Leadership Model used as conceptual framework. LEAD-Self instrument used to measure leadership styles, range, and adaptability.		pressure.			
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Appendix 6: Research Facilitators Evidence Table

Intervention (what it is, how often it is administered (brief reference details [Ref ID])	Who the intervention is aimed at.	Other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Country
(Adler et al. 1993) Social work educator-consultant	Non-supervisory clinical social workers in Department of Veterans Affairs Medical Center	Support group met regularly with consultant to strengthen research skills, maintain motivation, and promote publication.	Case-control study	Published or planned articles Longevity	Group successfully published seven articles with additional five in process. In contrast, second research group at same facility foundered after eight months. Similarities and differences between two groups are discussed. Recommendations made about how agencies might encourage and sustain practitioners in development and publication of clinical research	Social work	U.S.
(Brown & Fishbaugh 1995) Nurse research coordinator Negotiating the nurse research coordinator role.			Case study		Suggests how nurses can prepare for research coordinator role and negotiate added compensation. Without preparation, nurse's workload may not be adjusted to accommodate additional tasks and may lack remuneration. At worst, nurse may fail to meet expectations of investigator and sponsor. Nurse research coordinators can learn new marketable skills, increase income, create opportunities for publications and speaking engagements, and widen their professional network.		

					Sources of additional information about research coordinator role are provided.		
(Chadwick 1992)			Anecdote		Personal anecdote of moving into research coordinator role. Experience as staff nurse did prepare post-holder for change in professional status. Encourages nurses with similar goals to learn how to seek appropriate job, go to seminars/take classes, remain productive member of unit and learn interview skills.		
Research Coordinator Professional nursing with a new focus: staff nurse to research coordinator							
(Chapman & Combs 2005)	Collaborative Nurse Research Consultant position between Curtin University of Technology and Joondalup Health Campus.		Explorative qualitative research study. Questionnaire distributed to all nursing staff in ED. Follow-up semi-structured interviews conducted with 10 registered nurses. Content analysis identified themes from interviews.		Identified how Nurse Research Consultant position fulfilled R&D needs of emergency nurses. Study also highlighted factors impacting on ED nurses' ability to utilise and conduct research. Data analysis of interviews identified four main themes: enabling the research process, hindering the research process, assisting the research process and expanding Nurse Research Consultant role. ED nurses reluctant to become involved in research because of perceived lack of knowledge, skill level, time and motivation. Most nurses considered Nurse Research Consultant, formal education, cultural change, access to resources and involvement in research activities to assist contribution to research activities		
Collaborative Nurse Research Consultant							

(Douglas, Hill, & Cameron 1989). Clinical nurse specialist Clinical nurse specialist: a facilitator for clinical research.			Case study		Role of clinical nurse specialist continues to expand to include participation in clinical research. Clinical nurse specialist with joint appointment between clinical and academic setting can facilitate clinical research through collaboration. Such collaborative efforts can result in improved patient care and nursing practice. Describes several major collaborative models used to joint academic and practice settings and discusses strengths and weaknesses. Also describes collaborative approach in which CNS acts as facilitator for collaboration. Discusses formation of collaborative team, roles of participants, and research plan of team. Suggestions for implementing model in other settings are offered.		
(Harrison & Kitchens 1989) Research facilitator role	School of Nursing		Literature review and comparative case study		Identifies factors that enhance or impede successful implementation of research facilitator role in school of nursing. Authors review literature related to research facilitation and describe experiences in planning, implementing and evaluating such roles in two different schools of nursing. Implications for others initiating similar roles are identified		
(McGee 1998) Lecturer-practitioners	Lecturer-practitioner (LP) roles in four Nuffield Hospitals over period of		Interviews conducted with practitioners (LPs) themselves,		Nursing staff benefited from presence of LP linking theory to practice, role modelling, obtaining career advice and introducing change. Non-nursing staff also benefited from LPs' interdisciplinary		

	two years.		staff and managers. LPs also maintained structured diaries.		approach to certain care situations. LPs valued as resource and seen as important in maintaining image as provider of high-quality care. LP well placed to raise profile of nursing in independent sector through research activities. LPs benefited from experiences and able to develop own skills.		
(Mealer 2006)			Case study		Research supervisor in division of pulmonary and critical care medicine at Emory University in Atlanta, Ga supported by NIH grants describes how becoming a clinical research coordinator can stimulate professional development.		
Critical care research coordinator How to become a critical care research coordinator							
(Ocker & Plank 2000)	Research nurse role within oncology research program in large outpatient oncology clinic.		Literature review, analysis of job descriptions, dialogue with research staff, oncology staff, and clinical nurse specialist. Review of license and practice standards.		Identifies need for research personnel with appropriate skill mix to ensure that clinical trials are conducted safely and effectively, while scientific integrity is maintained. Findings provide framework for evaluating roles of registered nurse personnel in clinical setting. Although each institution has unique characteristics or research needs, method used is transferable.		
Research Nurse							
(Pelke & Easa 1997)			Literature review		Clinical research coordinator plays crucial role in organizing site's participation in multicenter clinical trials.		

Clinical research co-ordinator					Clarifies role of clinical research coordinator and outlines planning procedures leading to successful implementation. Emphasis is placed on establishing interdependent relationship with principal investigator, careful protocol assessment, team building, and staff feedback. Useful tools (study manuals and physicians' study orders) are described.		
(Raybuck 1997) Research coordinator The clinical nurse specialist as research coordinator in clinical drug trials.			Literature review		With advanced clinical expertise and knowledge of research process, Master's-prepared clinical nurse specialist can engage in research in variety of settings, including serving as research coordinator for clinical trials. Ethical issues related to conducting research with human subjects are discussed.		
(Rico-Villademoros et al. 2004) Clinical research coordinator (CRCs)	41 CRCs		Anonymous survey using four-page self-administered questionnaire on demographics, qualifications, and professional experience. 32-item questionnaire where respondents		To determine "standard" tasks performed by CRCs in oncology clinical trials. Response rate of 90% (37 out of 41) after two mailings. Less than half of respondents had received additional training in oncology, clinical research or Good Clinical Practices (GCP). Overall, all standard tasks performed by CRCs were "monitoring activities" and included patient registration/ randomization, recruitment follow-up, case report form completion, collaboration with CRA, serious adverse events reporting, handling of investigator files, and preparing site for and/or attending		

			rate frequency of involvement in activities using 3-point scale.		audits. CRC role in implementation of clinical trials goes beyond data collection and/or administrative support, and directly contributes to gathering of good quality data		
(Roberts & Rickard 2005) ICU research Coordinator The role of the ICU research coordinator in Australia: an invaluable resource for ICU research			Literature review		Describes Research Coordinator (RC) role in Australian Intensive Care Units (ICUs). Now over 70 RCs in Australian and New Zealand ICUs. Due to novelty, and lack of description of role in professional literature, the RC is misunderstood when in actuality, role is challenging and comprehensive, involving many aspects of clinical, academic, administrative and laboratory work. RC may undertake pharmaceutically sponsored trials, departmental research and audits. RC functions collaboratively in multidisciplinary research team and may undertake Principal or Co-Investigator roles. Role requires highly developed organizational skills and understanding of research methodology, legislation and standards. Explores development and current structure of RC role to promote correct perception of position as valuable resource for rigorous and ethical ICU research.		
(Roberts et al. 2006) ICU Research Coordinator		Cross-sectional web-based cohort study (2004) collecting free	To evaluate which factors RCs found as best and worst attributes of the role.		Describes Research Coordinator (RC) role in Australian Intensive Care Units (ICUs). There are anecdotal reports of RC role in various speciality areas. However, only one study has been published from intensive care setting. 49		

<p>The best and worst aspects of the ICU research coordinator role.</p>		<p>text information from RCs in ICUs in Australia and New Zealand.</p>			<p>participants (71%) completed study with 273 entries into two categories of 'best' (60%) and 'worst' (40%) aspects of role. Four thematic clusters in both categories: (1) How job was structured (2) Worth of job' (3) 'What work involves and (4) 'Who I work with. Both categories received proportionally same number of responses in each theme with (1) the most frequent and (4) least number of entries. Much variation between RCs in almost every descriptor of role. Australasian Intensive Care RCs value autonomy, respect and intellectual stimulation with scope for extending role to suit individual and find isolation, under-recognition and workload, often not sufficiently compensated, to be worst aspects of position.</p>		
<p>(Soltis-Jarrett 1997)</p> <p>Research facilitator</p>			<p>Case study</p>		<p>Describes role of research facilitator in conducting participatory action research (PAR). Researchers, along with participants, identify and illustrate individual concerns, beliefs, and values. Role of researcher, as facilitator, is extremely important. How nurse as facilitator initially "guides" discussions within participatory group is contentious.</p>		
<p>(Wilson-Barnett, Corner, & De 1990)</p> <p>Researcher-teacher</p>			<p>Two case studies</p>		<p>Demonstrates how researcher can work with nurses to identify relevant topics, provide support and specific education to improve care and subsequently to evaluate effects. Reflects importance of introducing individuals with researcher-teacher role amid practitioners</p>		

Appendix 7: Training Evidence Tables

The intervention tables have been split into studies that are about research training courses and studies where development of research skills are a subsection of the training programme.

Research training courses

Intervention (what it is, how often it is administered, include brief reference details & Ref ID)	Who is the intervention aimed at.	Other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country
(Adamsen, Larsen, & Bjerregaard 2003) 1-year research course in basic research methodology and critical scientific reflection.	Registered Nurses who have not yet reached masters level but have several years of clinical experience in one or more specialities.	None	Clinically controlled design comparing attendees with non-attendees. Semi structured interviews were utilised.	Research productivity and changes in the research culture of participants of course compared with a control group	Interview responses showed statistically significant differences between participants of course and control group in terms of research productivity (P-value<0.001), 89.2% of course participants were active in planning their own research projects compared with 35.7% in control group, and general research commitment (P-value<0.001). 95% of the students responded that the course gave them the stimulus to pursue future research plans. 89% expected to implement the	3211	Secondary care	Denmark

					<p>results of their project at their workplace. 72% hoped to publish their results and more than half (67%) would ask physicians to collaborate in an interdisciplinary research project. 63% stated that they were planning further education in research at Master's level. Some course participants moved forward with implementing their projects, some took up opportunities for further education and some have published their project results.</p>			
<p>(American Association of Critical-Care Nurses Thunder Project Task Force 1995)</p> <p>Thunder Project providing a research package and a support network to Critical Care Nurses.</p>	Critical Care Nurses.	None	<p>Descriptive survey. Evaluation tools specifically designed for project coordinators and participants were utilised.</p>	<p>Perceptions of site coordinators and research associates in relation to project material, project goals and research experience.</p>	<p>Process and content goals were met. Participation was described as personally rewarding and professionally enhancing, and stimulated these nurses to consider future participation in similar research studies. 95.2% of participants agreed or strongly agreed that participation increased interest in clinical research. 90.4 % agreed or strongly agreed that participation was professionally enhancing.</p>	3211	Secondary care	America

(Becker et al. 1999) Training for cancer control research.	Native health care workers (American Indians, Alaska Native, Native Hawaiians and American Samoans)	None	Follow-up study of the progress of the trainees over a three-year period.	Professional position of trainees, number of grants obtained for research in cancer control projects.	Only a few trainees had professional positions related to cancer control at beginning of training sessions; however, substantial proportion of 35 trainees redirected their professional efforts toward cancer prevention and control. In addition, several training program graduates have been awarded fellowship and small grants for cancer control projects among Native groups.	221	?	America
(Bydder, Packer, & Semmens 2006) Scientific writing training 3 hour workshop	Radiologists and radiation oncologists	The workshop was held in conjunction with the 2004 Royal Australian and New Zealand College of Radiologists Annual Scientific Meeting	Quantitative comparative questionnaire.	Comparison of pre and post (6-8 weeks after workshop) questionnaires regarding writing ability and resources.	Comparison of paired preworkshop and post workshop questionnaires responses showed increase in median category of agreement with statements regarding having required skills, having advice available and understanding structure of scientific articles. In addition, all participants reported that they found the workshop useful, said that they would recommend attendance to others and felt that such workshops should be available at future meetings. Half participants felt that workshop made it	2211, 3214	Health	Australia

					more likely that they would publish. However, there was a negative change in assessments of having time to write, this effect was probably due to a more realistic estimate by study participants of time and effort involved.			
(Grant et al. 2004) Short research course for cancer nurses.	Doctoral students, postdoctoral individuals, and recent master's program graduates	None	Descriptive long-term follow-up survey mailed to 128 cancer nurses who attended the course from 1984-1998.	Research involvement, activity and productivity since the course.	Course provided new investigators with a unique research experience not available at their own institutions and helped launch their research careers. Participants' commitment to research illustrated in their response rate to survey, record of studies, funding sources, and research roles. Course participants' employment revealed a pattern of moving towards full and tenured professorship positions as time since course increased. For those participants who attended course from 1995-1998, 3% held associate professor positions and 45% assistant professor positions. Remaining 52% had variety of research and teaching positions. In	3211	Primary, secondary care and academia?	America

					contrast to those attending participants who attended the courses from 1984-1998, 20% held full professorship positions and 37% held associate professor positions.			
(Halpain et al. 2005) The Summer Training in Aging Research Topics-in Mental Health (START-MH), federally funded national- level training program to offer short-term intensive research training for undergraduate, graduate, and medical students.	Undergraduates, graduates and medical students interested in working within mental health research.	All trainees had a mentor and a stipend so they would not have to work during the training period.	Qualitative project review	Formal and informal evaluations to assess the effectiveness of the training program from both the mentors' and trainees' perspectives, challenges in program implementation, and improvements necessary to attain the training Objectives.	Thirty trainees were selected from among 85 applicants. They worked on projects including basic, translational, clinical, or services research. Evaluations from trainees and mentors were uniformly positive. All the trainees reported that the START-MH program enhanced their interest in pursuing a career in geriatric mental health research. Several trainees later submitted their work for presentation or publication. The initial data suggest that the START-MH program can be a potentially useful model for attracting talented early-career trainees into mental health research.	Students?	?	America
(Hekelman et al. 1995) Three-part faculty	Academic family physicians	None	Quantitative evaluations	The number of papers published by faculty participants.	This series resulted in the publication of 16 papers from 13 of the 40 faculty participants.	2211	Academic	America

<p>development instructional program designed to teach writing skills. Educational interventions included seminars, workshops, and independent sessions centred on the faculty members' own written products.</p>								
<p>(Katerndahl 2000) Attendance at the Primary Care Research Methods and Statistics Conference.</p>	<p>Anyone working in primary care associated or interested in research.</p>	<p>None</p>	<p>Survey mailed to 423 conference attendees 3 years after attendance.</p>	<p>1.Changes in research productivity over time in conference participants. 2. Correlates of post conference productivity. 3. Comparison of participants with matched controls in terms of post conference research productivity (publication and presentation). Participants able to</p>	<p>294 participants completed the survey. Pre conference and post conference changes in research publications and presentations were significant, especially in novice researchers. Compared to colleagues who never attended the conference, post conference total publications and presentations were higher in conference attendees.</p>	<p>?</p>	<p>Primary Care</p>	<p>America</p>

				send blinded copy of their CV and CV of a colleague that had not attended conference				
(Laserson et al. 2005) Operational research course in resource-poor countries. Combination of didactic lectures and applied field exercises were used to achieve the main objectives of the 6-day course.	National, provincial or state and district-level national TB control program (NTP) managers and TB laboratory directors and staff in developing countries.	None	Descriptive evaluation.	Completion of operations research proposals.	44 Operations research protocols have been completed or are underway to improve the effectiveness of NTPs. Since 1997, the OR course has been conducted nine times in five countries: Vietnam, South Africa, Mexico, Latvia and Russia. 149 key NTP and TB laboratory staff have been trained in OR methods.	2321	National Research Programs	Developing countries
(Parkes et al. 2001) Cochrane review of teaching critical appraisal in health care settings.	Health professionals	None	Cochrane systematic review of one RCT	Process of care, patient outcomes and knowledge of health professionals	One USA hospital-based randomised trial was included involving 44 doctors. The outcome assessed was critical appraisal knowledge. Process of care, patient health or attitude/ awareness outcomes were not assessed. Critical appraisal teaching was	2211	Health	America

					<p>reported to have resulted in a 25% improvement (adjusted figure) in critical appraisal knowledge in the intervention group compared to a 6% improvement in the control group, which was statistically significant (p=0.02). Critical appraisal teaching had positive effects on participants' knowledge, but as only one study met the inclusion criteria the validity of drawing general conclusions about the effects of teaching critical appraisal is debatable. Large gaps in evidence as to whether teaching critical appraisal impacts on decision-making or patient outcomes. It is also unclear whether the size of benefit seen is large enough to be of practical significance, or whether this varies according to participant background or teaching method. Evidence supporting all outcomes is weakened by generally poorly designed, executed and reported studies .</p>			
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(Sommers et al. 1996) Writing and publication workshop.	Faculty and fellows	None	Three-part evaluation plan incorporated both quantitative and qualitative methods: questionnaire, qualitative interviews and publication analysis.	Comparison of types of publications before and after workshop and rates of publication. Perceived changes in knowledge and skills. Participant's perceptions of the workshops usefulness.	Eighty individuals participated in five workshops given during 1991-1995 period. Pre/post self-assessment data indicated significant increases in perceived knowledge and skills in all nine areas of assessment. Follow-up interview data showed that participants felt that workshop motivated them to begin and sustain writing projects, gave them skills that made their writing more effective, and demystified the submission and publication process. Analysis of difference between pre- and post workshop rates of publication showed significant increase in rate of publication.	221, 232	Academic?	America
(Taylor et al. 2000) Systematic review of critical appraisal training for clinicians.	Medical students (6 studies) or newly qualified physicians (4 studies).	None	Descriptive systematic review of 10 controlled studies all included a comparator arm.	Range of outcomes grouped into 4 broad areas: participants' knowledge of epidemiology/biostatistics, their attitudes towards medical literature, their ability to appraise a	Overall improvement in assessed outcomes of 68% was reported after critical appraisal skills training, particularly in knowledge relating to epidemiology and biostatistics. Studies with a control group receiving no	2211	Health	2 studies in Canada, 7 studies in America and 1 in Mexico.

Length of training ranged from a total of 180 minutes over a 1-week period to 16h over the period of a year.				research article and medical literature reading behaviour.	educational input reported a higher proportion of positive outcomes than the studies with a comparative educational input. The review appears to provide some evidence of the benefit of teaching critical appraisal skills to clinicians in terms of both knowledge of methodological/statistical issues in clinical research and attitudes to medical literature. Evidence for improvement in ability of participants to appraise evidence critically, or for change in medical literature reading habits was not convincing. Findings should be treated with caution as methodological quality of studies was generally poor, with only one study employing a randomised controlled design.			
(Taylor et al. 2004) Half-day critical appraisal skills training workshop based on CASP.	General practitioners, hospital physicians, professionals allied to medicine, and healthcare	None	Prospective controlled trial employing a waiting list control.	The following outcomes were assessed at 6 months follow-up: knowledge of the principles necessary for appraising evidence; attitudes towards the use of	At follow up overall knowledge score [mean difference: 2.6 (95% CI: 0.6 to 4.6)] and ability to appraise a systematic review [mean difference: 1.2 (95%CI: 0.01 to 2.4)] were higher in the critical skills training group	2211, 321, 1181.	Health	UK: South West of England

	managers/administrators from the South-West of England.			evidence about healthcare; evidence seeking behaviour; perceived confidence in appraising evidence; and ability to critically appraise a systematic review article.	<p>compared to control. No statistical significant differences in overall attitude towards evidence, evidence seeking behaviour; perceived confidence, and other areas of critical appraisal skills ability (methodology or generalizability) were observed between groups. Taking into account workshop provision costs and costs of participant's time and expenses of participants, average cost of providing critical appraisal workshops was approximately £250 per person. Findings challenge policy of funding 'one-off' educational interventions aimed at enhancing Evidence-based practice of health care professionals. Future evaluations of evidence-based practice interventions need to take in account this trial's Negative findings and methodological difficulties.</p>			
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Research as subsection of other training

Intervention (what it is, how often it is administered, include brief reference details & Ref ID	Who is the intervention aimed at.	Other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country	Notes
(Bunch et al. 2004) Combined internal medicine/PhD program, the Clinician Investigator (CI) Program	Clinician Investigators	None	Survey Separate survey instruments were developed for individuals who had committed to completing both the residency and PhD components and for graduate advisors of individuals who were granted the PhD.	Clinician Investigators opinion of the programme and what they think they gained.	Most Clinician Investigators believed that each component of the programme (clinical training and research training) provided mutual benefits and that their teaching skills were enhanced. The graduate advisors were overwhelmingly positive about the Clinician Investigators they had advised and indicated that they would welcome a Clinician Investigator as a PhD student in their laboratory again.	2321	Academia	North Carolina, America	Have copy of article
(Chung, Diaz, & Li 1999) Integration of research training into the daily work of surgical	Trainees on a surgical residency in a community hospital.	None	Qualitative project review.	Number of trainees participating in projects. Number of presentation at national meetings and	Over a 3-year period, 10 of 16 trainees participated in at least one project. Thirteen projects were presented at national meetings and 13 articles (including 6 from presentations)	2211	Community Hospitals.	America	Have article The articles noted that the integrated program trains multiple residents/projects with low

residency.				articles arising from the projects.	were published. Three projects were abandoned for lack of progress, and 5 manuscripts have been rejected.				requirements in space and funding, but high demands of organization and faculty time
(Fischer & Cation 2005) A research elective in a residency program including resident research director, cost reimbursement and a research requirement.	Individuals on a community-based internal medicine residency program	None	Interventional study	Number of research submissions, number of faculty co-authors and instructional costs	The annual number of research submissions increased from 0 to 39 over 6 years. The greatest increase in number of research submissions was seen following the dual implementation of the cost reimbursement and research requirements interventions. The annual number of faculty co-authors rose from 0 to 24 in 6 years. Average cost per accepted project was US 1,023.00 dollars.	2211	Community	Illinois, America	Cost of supporting resident research activity is significant.
(Gay & Hillman 2000) 1-month mandatory research rotation in a resident's course.	Radiology students on residents course	Residents chose a faculty mentor to work with during the research rotation.	Survey composed primarily of closed-end questions.	Research activity defined as research project submission to competitive forum (poster competition,	All 24 residents filled out the survey. 17 residents thought the experience was worthwhile and the research month should be continued; 2 residents did not. 10 residents reported that in retrospect, they would have done the rotation	3214	Academia	University of Virginia, America	Have copy of article

				oral abstract competition, publication), resident interest in research and opinions and experiences of 24 residents who completed research rotation during 31/2 year period/.	even if it had not been required, and 8 reported that the experience increased their appreciation of value of research in medicine. 13 residents presented data at a meeting, and 3 of these presentations won awards. Resident research projects resulted in 18 manuscripts at time of survey (7 published, 8 in preparation, and 3 in revision or review).				
(Grimmer et al. 2005) Australian university provided clinical and research education assistance to a Filipino University. Aim was to establish 1 st Filipino Master of Science in Physical Therapy program to train	People wanting to train as physiotherapists in the Philippines.	Mentors for course tutors.	Descriptive survey.	Research activity and publications.	Research activity and publications have increased as a result of completion of the program.	3221	Academia	Philippines	Would this article be better in collaboration? On order

physiotherapists in their home country.									
(Hillman et al. 1998) Introduction to research program for 2 nd year radiology residents.	2 nd year radiology residents.	None	Survey	Career plans, research participation and academic achievements of residents who participated in the program compared with residents that were non-participants who were in the same residencies as the participants at the same time.	Survey completed by 321 participants (81%) and 1,153 non-participants (56%). More than a third of participants thought program had a strong effect on their initial career decision. 41% of participants who completed training were currently in academia versus 26% of non-participants. Of 321 participants, 35% believed they would spend most of their career in academia and 15% thought research would be their major focus versus 19% and 8% for non-participants. Participants had higher levels of academic achievement earlier in their career than non-participants.	2211	Academia	America	Have copy of article.
(Hollander, Valentine, & Brogan, Jr. 1997)	Undergraduate medical students.	Departmental research goals established.	Systematic project evaluation	The number of publications and abstract presentations	Over 4 years since educational program started, the departmental publication rate has increased from	2211	Academic and emergency	New York, America	Code for students? Have paper

An educational program about clinical research related to emergency medicine. Student work as research assistants within the Emergency department				annually; the number of faculty who have been authors on manuscripts; and the number of ED staff who have participated in research projects.	2 to 20 manuscripts. While there was only 1 faculty member with a research publication in 1992, there were 9 faculties with manuscripts accepted for publication in the first 6 months of 1996. Similarly, more nurses and ancillary staff have become involved in prospective clinical research.		medicine.		
(Ishiyama 2002) Participation in research with faculty members whilst an undergraduate student.	Undergraduate social science and humanities students.	None	Descriptive evaluation utilising College Student Experience Questionnaire	Academic progress of students, student experiences inside and outside the classroom.	1,025 students in collaborative undergraduate research early on reported significant gains in ability to (1) think analytically and logically; (2) put ideas together; (3) learn on their own. These gains were greater than those reported by students who did not participate in collaborative research with a faculty member. Students who had participated in collaborative research scored significantly better on Students Independent Analytical Development Scores –	2322?	Academia	America	Code for students? Not related to health should it go? Have article

					74.1% reported high development scores compared to 47.3%.				
(Kluger 1998)	Registrars on F.A.N.Z.C.A. diploma	None	Questionnaire – mailed survey	The perceived advantages and disadvantages of the project, value of formal research teaching methodology and future career intentions of trainees.	Forty-nine of fifty-six (86%) respondents replied to survey. 15% felt formal project had no value, 54% found it possibly useful whilst 31% perceived it as very useful. Advantages included appreciation of research skills and ability to critically appraise research. Disadvantages included lack of dedicated time, space and funding and production of poor quality research. Majority (63%) favoured formal teaching of research methods for F.A.N.Z.C.A. diploma, ideally taught before Primary (30%) or in Provisional Fellowship year (36%). Few respondents indicated willingness to undertake a major commitment to research in future (4%) but 46% wanted some contact with research and teaching as part of their normal work.	2211	?	?	From abstract concludes that a more structured teaching in research methodology, assessment of published work and presentation skills may be more suited to the long-term goals of the majority of clinical anaesthetists

(Millis et al. 2004) Research training program	Residents	None	Descriptive	Quality and quantity of resident's research.	Statistically significant increases in total number of publications (P = 0.03) and number of empirical, data-based publications after implantation of program (P = 0.03).	2211	Academia and secondary care.	America	Ordered article
(Percy, Juul, & Scheiber 2004) Residency training track developed by the American Board of Psychiatry and Neurology	Child neurologists interested in becoming researchers .	None	Descriptive	Careers progression of trainees, number of articles published, any further funding obtained.	Since 1992, 38 residents from more than 20 training programs have been accepted into this pathway. Of the 28 who have completed residency training, 22 are in academic positions as faculty or fellows, and 6 are working in non-academic hospital settings. Of these 22, 6 describe their research as basic, and 12 describe their research as being both basic and clinical; 15 have been successful in obtaining external funding. Thus far, these trainees have published more than 125 articles in peer-reviewed journals. Although small in scope, training track has met objective of producing clinician-scientists	2211	?	?	From abstract

(Rawlins et al. 2000) Four-year PhDs in neuroscience. First year includes taught courses, which give students much broader training in theory and techniques of neuroscience and research projects.	Students wishing to undertake a PhD.	None	Qualitative study that includes a discussion of course organisers experience and the four students accounts of their 4 year PhD.	Outcomes of course for students and their opinions.	First year gives students chance to try variety of different areas of neuroscience and they often choose different areas to they expected to. Some students develop own PhD project linking a number of areas and thus promote inter-disciplinary research. Survey of students at end of first year show generally enthusiastic approval for the course structure.	2321	Academia	United Kingdom	Aim was to make the selection of doctoral research projects and supervisors by students more rational. Have copy
(Segal et al. 1990) Research involvement in medical school	Medical school graduates of 1980, 1981 and 1982 from The Pennsylvania State University College of Medicine (PSU), The University of Connecticut School of Medicine (UCONN),	None	Questionnaire – cohort study to compare impact of mandatory research project at PSU.	Medical activities, career progression of the graduates, research involvement, further training of the graduates.	A total of 567 graduates completed the questionnaires, an overall response rate of approximately 76%. Medical school research experience was reported by 83% (183) of the PSU graduates, 34% (52) of the UCONN graduates, and 28% (54) of the UMASS graduates. When compared on school-by-school basis, graduates from three schools did not differ with respect to residency specialty training, fellowship	2211	?	America	

	and The University of Massachusetts Medical School (UMASS)				training, academic appointments, career practice choices, or postgraduate research involvement. However, when all graduates examined as single group, medical school research experience was found to be strongly associated with postgraduate research involvement.				
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Appendix 8: Funding Evidence Table

Intervention (what it is, how often it is administered, include brief reference details & Ref ID)	Who is the intervention aimed at.	Any other interventions used in parallel with main intervention	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country
(Albanese et al. 1998) Institutionally supported programs for educational research and development grants at University of Wisconsin School of Medicine.	Staff at University of Wisconsin School of Medicine.	None	Not clear	Outcomes of first three cycles of awards in terms of number of projects, publications and presentations.	28 intramural funded projects, a 200% increase in funds for educational research from local sources other than the medical school, two new grants funded from extramural sources, one peer-reviewed publication, three presentations at national meetings, and six presentations at local meetings.	?	Academia	America
(Akhter, Hyder, & Qayyum 2003) Funded doctoral training in an institution out of	Researchers in Pakistan	None	Follow-up survey of 54 researchers who had had funded training in the past 3	Number of papers published. Number of students trained or mentored. Number of research grants achieved.	On average researchers had published 15 papers, and had trained nine students since return to Pakistan. On average respondents had received 5-6 research grants since the completion of their training.	232	Academia	Pakistan

Pakistan. Average duration of training was 4 years.			decades.					
(Armstrong et al. 1997) Heart and Stroke foundation of Canada (HSFC) Research Scholarship Program	Medical staff interested in doing research.	None	Cohort study	Data were collected on yearly publications and citation counts for each individual. Individuals awarded scholarships were compared with unsuccessful applicants.	During 10 years of study, individuals funded by the (HSFC) published more papers, more of their papers were cited, and they received more citations per individual than unfunded comparison group. This consistency in multiple indicators provides strong evidence that funded individuals are more productive and that their work has a greater impact on body of knowledge. Although study cannot unequivocally show direct causal relation between funding and research success, trend shown by indicators studies suggests a beneficial effect.			
(Beck & Depew 2001) Canadian research fellowship training programs in digestive science.	Career investigators in digestive sciences	None	MRC records and minutes of CAG annual meetings were reviewed to identify research fellowship support. Canadian program directors were requested to list research fellows affiliated with their groups	Career progression	Eighty-six research fellows were trained. Responses were obtained from 43 of them. The demographic characteristics of the whole group and the respondents were similar. Of the respondents, 81% of trainees obtained academic appointments. Fellowships longer than 1 year were associated with higher rates of academic posting, and MRC-funded fellows had greater success rates of academic appointments. Of eligible trainees 63% have obtained OG support. None of the other variables examined predicted success. Of the trainees responding, 85% valued the fellowship very highly. The	2211	?	America

			between 1986 and 1997. Only fellowships providing at least 1 year of training included. 7-page questionnaire detailing biographic characteristics, site and duration, and specific issues related to the quality of research training was sent to identify trainees.		establishment of the additional research fellowships has fostered the development of career investigators in digestive sciences. The high success rate of former trainees in obtaining academic appointments and OG support suggests that fellowship programs are effective and appropriately oriented. Structure of current programs does not require substantial revision. OG support for new investigators appears now to lag substantially			
(Ferguson et al. 2000) Funding for NHS reactive research programmes in the Northern and Yorkshire region.	Recipients of regional reactive research programme funding (biomedical, health services research (HSR), and primary and community care programmes)	None	Retrospective postal survey utilising a questionnaire.	Peer-reviewed publications, non peer-reviewed publications, presentations, seminars and workshops, change in individual practice, changes in NHS service delivery and organisation, and impact on the careers of researchers.	Overall, 119 projects produced 230 peer-reviewed publications: this was achieved at an average cost of 10,673 pounds, 6,386 pounds and 22,310 pounds per publication for the biomedical, HSR, and primary and community care programmes respectively. From the qualitative data analysis, important changes in individual practice and NHS service delivery were identified by respondents. The researchers in our sample appeared to have attracted over 6 million pounds in R&D funding related to the initial research grant. Although based on self-	232, 118, 221, 2211, 322, 3211	NHS	Northern and Yorkshire region, UK

	between 1 April 1991 and 31 March 1996.				report, there is evidence to suggest that the return on investment from the NHS R&D can be substantial, taking a broad view of benefits to the NHS and researches.			
(Fung, Hitchcock, & Fisher 2005) Funding family physicians for research training. 28 family physicians each received a 2-year advanced research training (ART) grant from the American Academy of Family Physicians (AAFP) to be used for improving skills in research methods.	Family physicians	None	Qualitative research to assess extent awardees had achieved objectives they gave when they applied for the award. Measured mid cycle by impact questionnaire and at end of two years by final report. To ascertain changes in awardees research skills and productivity they contacted colleagues of each awardee.	Achievement of objectives, research skills development and research productivity.	Only 13 of the recipients sent in the final reports. From the first two cohorts, the percentage of awardees who achieved their objectives ranged from 50% to 76%. Awardees colleagues reported that awardees had improved their research skills, grant and publication writing ability, and had greater leadership skills. Having only 2 years funding, lacking sufficient protected time, and inadequate resources were cited as barriers to research productivity	2211	Primary Care	America
(Goodman et al. 2002) Centres of Excellence in Women's Health (CoEs) funded by	Researchers at one of the 15 nationally designated Centres of Excellence in Women's'	None	Qualitative evaluation utilising interviews.	Organizational issues including Impact of CoE designation on institution, greatest strengths and challenges affecting	Study indicates that national designation served to legitimize and expand the scope of women's health within the recipient institutions. The CoEs enhanced collaboration among researchers and practitioners, and were able to leverage additional resources.	?	?	America

the U.S. Department of Health and Human Services' Office on Women's Health.	Health			CoEs and core components of research, clinical care, professional education, leadership and community outreach and whether core components developed an interface and coordinated with one another.	The core components largely were successful at interfacing in accordance with the national model. Notwithstanding these successes, the CoEs remain susceptible to failure if they do not gain additional support for the concept of women's health within the recipient institutions, and will not remain durable without additional and stable funding sources			
(Graham et al. 1997) Substance abuse fellowship program in family medicine.	Family medicine practitioner	None	Telephone interviews of fellows 7 years after completion of the programme.	Involvement in teaching, research clinical administrative, scholarly and networking activities before and after scholarship, CV of fellows were also examined.	Initially fellows contributed modules to a Society of Teachers of Family Medicine publication and increased substance abuse teaching in their home institutions. Seven years later, fellows reported increased activity in substance abuse teaching, clinical, administrative and research activities over those prior to the fellowship and attributed these increases to the fellowship. Fellows' CVs reflected increased publications, presentation and networking activities with each other.	2211	Academia	America
(Harris et al. 1993) 3-week Primary care policy fellowship sponsored by US Public Health Service.	Senior-level practitioners, academicians, researchers, and administrators.	None	Qualitative research method not clear.	Expectations of and reasons why fellows participated in fellowship, degree of perceived learning, identify sessions of most value, and personal goals achieved by fellows relating to their future leadership in primary care.	8 fellows most highly valued the networking across primary care disciplines, the sessions with constituency groups, and discussions about influencing decision makers. The leadership skills development activities particularly met their expectations. Their skills were improved in identifying ways to influence policymakers, in locating resources for primary care research, and in networking with primary care leaders	221, 232 and 118.	Primary care	America

<p>(Lee & Saunders 2004)</p> <p>Awarding of small bursaries to support local research. £6818 was awarded to 19 applications involving 22 individuals.</p>	<p>All primary care workers in Oxfordshire and Buckinghamshire belonging to the primary care research networks.</p>	<p>None</p>	<p>Qualitative research utilising semi-structured interviews to ascertain outcomes of projects funded by bursaries. Effects for individuals in terms of developing research skills and promoting their research career.</p>	<p>Project outcomes, research skills and productivity of individuals involved in sponsored research project.</p>	<p>Six published papers to date Six international conference presentations Ten national presentations Many local presentations or network newsletter articles. Further funding obtained of £117500, a 16-fold return. Other less tangible outcomes emerged Ten of the recipients gave details of contacts that had been made with them. Eleven recipients quote examples of changes in practice which had resulted. Four of the recipients gave details of new opportunities that had presented themselves. Thirteen interviewees were able to identify specific areas of skill or career development. Most recipients felt that being able to put the award on their CVs opened doors for them, either towards further funding or in terms of career options. Not all recipients wanted to promote a research career but several felt more able to take an evidence-based approach to their clinical practice.</p>	<p>3211 2211 3221 3217</p>	<p>Primary Care</p>	<p>Oxfordshire and Buckinghamshire, England</p>
<p>(McKay & Daniels 2003)</p> <p>Funding of fellows for Canadian Association of Gastroenterology (CAG) postdoctoral</p>	<p>Academics</p>	<p>None</p>	<p>Interventional study using quantitative measures.</p>	<p>Number of papers published. Impact factor of journal articles published in. Follow-up data to determine number of articles published and impact factor of journals they published in over 10 year period.</p>	<p>Between 1992 and 2000, fellows authored 247 articles; 176 being original research articles, 31 (17.5%) of which appeared in journals with impact factors of greater than 10. 31 former fellows (26%) have progressed to faculty positions.</p>	<p>232</p>	<p>Academia</p>	<p>Canada</p>

fellowship programme.								
(Mavis & Katz 2003) Funding of new investigators by the March of Dimes Birth Defects Foundation.	New researchers	None	Cohort study to determine quantity and quality of scholarship and federal grant awards for successful and unsuccessful applicants. Employment and research activities of successful applicants.	Research productivity, career progression.	Applicants receiving funding were more productive in terms of the quantity and quality of publications as well as federal grant support. A greater proportion of successful applicants came from top-ranked institutions and at follow-up the proportion of successful applicants in top-ranked programs increased. At follow-up, most successful applicants had tenure-track appointments with significant time dedicated to research. Women were underrepresented among successful applicants.	232	Academia	America
(Reuben et al. 2004) Supporting fellows to attend Centres of Excellence (CoE) program	Fellows	None	Evaluative study utilising quantitative and qualitative methods.	Career of funded fellows.	Since its inception, the CoE program has supported 163 geriatrics fellows of whom 63% entered academic geriatrics. Almost half of these graduating fellows have gone to new academic institutions. CoEs have also supported 222 faculties, including some who were in disciplines other than geriatrics. Vast majority (82%) have remained in academia, and nearly two-thirds are currently in geriatrics.	2211?	Academia	America
(Simon et al. 1999). Research-intensive general internal medicine fellowship	Graduates of the Harvard General Internal Medicine Fellowship Program,	None	Survey	Number of presentations, number of articles published, career progression of graduates, involvement in teaching.	Of 105 surveys, 103 (98%) were returned. During the fellowship, 82 graduates (80%) presented research findings at regional or national meetings, 89 (86%) published peer-reviewed articles based on their fellowship work, 75 (73%) preceptor residents or medical	2211	?	America

program.	which began in 1979				students in the ambulatory setting, and 67 (65%) taught medical students in the preclinical years. At the time of the survey, 100 graduates (97%) held academic appointments: 48 as clinician-investigators, 23 as clinician-administrators, 15 as clinician-educators, and 15 as clinicians. Graduates of this research-intensive fellowship pursued academic careers with research, teaching, administration, and clinical activities.			
(Steiner et al. 2002) Primary care fellowship.)	1988-1997 graduates of 25 National Research Service Award primary care research fellowships in the United States	None	Quantitative - mail survey	Outcome measures were: 1) Publishing 1 or more papers per year since the beginning of fellowship, or 2) serving as principal investigator (PI) on a federal or non-federal grant.	One hundred forty-six of two hundred fifteen program graduates (68%) completed the survey. Thirty-two percent had published 1 or more papers per year, and 44% were PIs. Male gender (odds ratio [OR], 3.6; 95% confidence interval [95% CI], 1.4 to 9.2), self-reported allocation of 40% or more of fellowship time to research (OR, 4.4; 95% CI, 1.8 to 11.2), and having an influential mentor during fellowship (OR, 5.0; 95% CI, 1.5 to 17.2) were independently associated with publishing 1 or more papers per year. Fellows with funding as a PI were also more likely to have an influential mentor (OR, 3.0; 95% CI, 1.3 to 7.2). Primary care fellows who had influential mentors were more productive in research early after fellowship.	2211	Primary care	America
(Taylor et al. 2001)	Primary care physician-faculty	None	Quantitative survey using a self-	Career outcomes of funded fellows. Primary outcomes were recent	Of the 500 respondents, 234 of the physician-faculty had completed a fellowship and 266 had not. Fellowship-	2211	Primary Care	America

Fellowship training for primary care physician-faculty.			administered questionnaire.	grant submissions and funding, career refereed publications, rank, and salary.	trained physician-faculty were more than four times as likely to have submitted a grant proposal and to have had a grant funded (both $p < 0.0001$) than were physician-faculty without fellowship training. They were also more likely to have had any refereed publications (OR 3.8, $p < 0.0001$) and to have achieved senior academic rank (OR = 1.9, $p = 0.02$). Among those with fellowship experience, the amount of research training was important. Those with at least one year of research experience in their fellowship program had more grant proposal submissions (OR = 1.9, $p = 0.02$), more grants funded (OR = 2.9, $p = 0.0003$), more publications (OR = 2.4, $p = 0.02$), and higher academic ranks (OR 2.3, $p = 0.03$) than did those with less research training. Salaries were similar in every comparison. Fellowship-trained primary care physician-faculty was more productive researchers and was more likely to have achieved senior academic rank than were their non-fellowship-trained peers. Even among physician-faculty with fellowship experience, more research training was associated with higher productivity and rank. Salaries not affected by training experience			
(Vogler 2004) In 1996 the American Cancer Society initiated a	Junior investigators.			Prior research experience, Publications and academic status.	Although small differences were seen between the funded and unfunded group, the major finding was that those applicants with prior research and publication experience were more likely	2321	?	America

Clinical Research Training Grant for junior investigators. 3-year mentored grant for preclinical and clinical research training.					to get funded, but both groups were highly motivated to seek an academic career.			
(Zucker et al. 2004) Veterans Affairs (VA) Research program – peer-reviewed funding mechanism for basic and translational research.	Physician scientists	None	Descriptive evaluation to assess the impact of the VA research program	Number of VA physician scientists. Improvements in medical care.	Merit Review research funding has been essential to the training, recruitment and retention of productive VA physician scientists. The VA research program has contributed both basic and clinical innovations that have led to improvements in medical care. Development of initiatives that entice outstanding Ph.D.'s to develop their careers in the VA has been crucial to the success of the program. The VA research program has fostered a mutually beneficial relationship with affiliated medic	2321	Academia	America

Appendix 9: Networks and Collaborations Evidence Table

Intervention (what it is, how often it is administered, include brief reference details & Ref ID)	Who is the intervention aimed at.	Any other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country
(Armstrong, Reaman, & Children's Oncology Group. 2005) Multidisciplinary, multi-centre clinical trials cooperative	Psychology researchers		Not described.	'Reviewed' progress of cooperative research involved in the networks. No empirical data provided.	Benefits include; Multidisciplinary collaboration, increased access to research subjects, shared research infrastructure, access to longitudinal cohorts. Barriers are cost, quality control, competition for ltd resources and authorship challenges	2212	Tertiary	United States
(Branstetter & Sakakibara 1998) Examines impact of involvement in Japanese sponsored research consortia	Industrial researchers using research consortia in Japan		Econometric evaluation	Research patents	Increased intensity of input into research consortia increases research input and output as measured by patents. Participation in research consortia may create 'knowledge spill over' effects.		Commercial industry	Japan

(Braun et al. 2003) Cancer awareness and research capacity programme	Community and scientific advisors, 'budding researchers' and staff that deliver interventions / projects	Skills and resource transfer through training, technical assistance & mentorship	Survey	Number of awareness plans and projects developed & research accomplishments, appropriateness as judged by advisors	9 funded awareness projects developed; state-wide awareness plans produced; 42 budding researchers enrolled in training; 22 budding researchers involved in 14 funded projects. Positive community perceptions of cultural appropriateness and scientific rigour.	221, 232	Community	USA
(Chandiwan a & Ornbjerg 2003) Collaboration between Danish and Zimbabwean research laboratories and a training institute – purpose to support Zimbabwean research group build capacity	Institutional level support for scientific researchers	Including: scientific training (PhD training & short courses)-, joint research programmes; technology transfer.	Descriptive (almost case studies, although it is not called this)	International collaborations and partnerships, PhD graduates; staff retention	International collaborations; 18 PhDs; successful at staff retention (in time of political instability), Zimbabwean group has developed local credibility	232	Scientific researchers	Denmark and Zimbabwe
(Clement et al. 2000) Towards a conceptual	Primary care research networks		Discussion paper	Proposes range of outcome measures and process indicators	Theoretical paper	Primary care practitioners	Primary care	UK

framework for evaluating primary care research networks.				linking to 7 key objectives. Eg existence of clear objectives, number of higher degrees, satisfaction with networks.				
(Higginbotham 1994) International collaboration epidemiology network (INCLIN)	Social scientists and epidemiologists							
(Jackson et al. 1994) Community network for the 'Stanford Five City Project								
(Pearce et al. 2004)	Clinicians involved in an ambulance network.	Development of a new practice-based research network (PBRN). Clinician involvement in planning project	Audit	Collection of diagnostic, risk factor and demographic data to help formulate hypotheses and understand the target population.	Growth in network membership; data to guide and inform research activity; use of data to improve healthy lifestyles. 23 clinicians recruited 33 colleagues. Of these, 56 primary care clinicians collected data on 2228 office visits.	Primary care clinicians	Primary care	US
(Pitkethly & Sullivan 2003)	Primary care practitioners	£140k for 4 years from the Scottish	Descriptive	Grants, publications, training and	Training became sustainable through external sponsorship.	GPs and dental practices,	Primary care	Scotland

		Office Department of Health. Support for novice researchers through training		fellowships, sustainability, numbers of active practices	Increase in research practices (6); training fellowships (3); registration for higher degrees (18), grants (£3.9m); publications (96), 495 primary care staff from 27 professions involved.	AHPs, nurses, pharmacists, practice managers.		
(Plastow et al. 1999) Establishment of a multi-professional research team in non-academic general practice	Nurses and GPs in primary care	General practice given research status, funding for protected time for researchers. Monthly steering meetings.	Descriptive	Development of research expertise; Publications; successful grant applications; develop research culture.	1 successful grant application. Other outcomes not specified.	2211, 3211, 3212	Primary Care	UK
(Ruccione et al. 2005) Relates to the Oncology group above	Nurse researchers			Aimed to integrate nurse researchers into scientific activity of a larger network	Development of concept proposals, companion protocols, nurse-led publications and nursing objectives in therapeutic trials	3211	Tertiary	United States
(Smith 2004) EC Framework 5 research training network for young researchers join team in	Pre or post-doc researchers in Europe from interdisciplinary backgrounds	Pursue a specific project around the demographics of grandparents	Not stated	Not stated	Not stated	Mixed (not just health) disciplines	Academia	Europe

another country								
(Thomas & While 2001) Examines the first 30 months of primary care research networks in England. WeLReN	Primary care research networks and affiliated practitioners			Membership, research activity, staff involvement	900 members of the network; 12 teams (2.4% of practices) were involved in running research; 24 research projects funded; 33% of GPs and 18% of nurses involved in activity; conference attendance (296); named applicant on successful bids (41)	2211, 3211	Primary care	England
Other literature (cited in (Branstetter & Sakakibara 1998) above.				Motivation for being involved in consortia. Impact on R&D spending. Firms' subjective evaluation of consortia.	Organisations were involved in consortia to access complimentary knowledge. Firms increase own spending in response to increased R&D subsidies. Involvement in consortia brings mixed benefits. Firms are sensitive to the costs vs benefits of consortia involvement. Research that is close to the 'technological frontier' do not always bring financial gains.			

Appendix 10: Infrastructure Evidence Table

Intervention (what it is, how often it is administered, include brief reference details & Ref ID	Who is the intervention aimed at.	Any other interventions used in parallel with main intervention.	Research Method/ Design	Outcome (what is been measured, when, how)	Results	Professional Group (Code)	Sector	Country
(Ariza et al. 2004)	Paediatric researchers in primary care		Survey	Explored computer capability, including hardware types, software programs, internet use, views on privacy and security., receptivity to future electronic data collection approaches	Demonstrated a range of hardware and software access and that participants would be willing to consider a range of electronic data collection sources; barriers include training and privacy concerns.	Primary care paediatric research group	Primary care	NS
(Foxcroft & Cole 1999) (not coded) unpublished systematic review	Nurses or nursing researchers	Organisational structural interventions defined as interventions primarily about changes in organisational systems, such as organisational	Systematic review Effectiveness of Organisational Structural Interventions to (1) Promote Nursing Research; and (2) Promote	A range of outcomes were reported including publications, training, PhD completion rates; acquiring knowledge and skills; satisfaction with experience; improved patient	9 papers were included. The authors were unable to draw conclusions due to the poor quality of the study designs.	Nursing		Various

		policies, working patterns and skill mix, collaborative units, nurse development units, research and development support systems, clinical supervision programmes, clinical effectiveness directorates and setting or site of services.	Nursing Research Utilization	care; organisational image and participation in research; nurses' participation in research; completed studies; library usage				
(Greenwood & Gray 1998)	Nurse academic unit	Develop a research culture using reward systems for research productivity and development; funding Designated Research Groups; Faculty Research Support Units, clinical nursing chairs and research seminars	Not stated	Research productivity; Intersectoral relationships; visibility and appreciation of nursing research	Within 128 months, 2 DRGs established; 30 research projects commenced; \$461 240 (AUD) in research funds were awarded to research projects; 2 authored books, 1 edited book; 4 contributed chapters; 14 refereed journal papers; 6 international conf papers; 9 national conf papers.	Nursing	Joint academic / industry	Australia

(Karlik & Sauerbrei 1998)	Radiology residents		Survey to assess the status of research infrastructure for residents	Presence of critical enquiry program, access to research training, importance of research to the training program	14/16 universities have research and critical enquiry program; research methods are widely taught and believed to be important; few residency programs view research as essential to completion of training; strong commitment for research programs.	Radiology residents	Academic training	Canada
(Kruse et al. 2003)	Non military family practice residence program		Survey of directors of programs	11 research support infrastructure characteristics and 6 research productivity measures	Employment of full-time research professionals was the only characteristic with research productivity for small and large programs. For large programs, research productivity was positively associated with the presence of fellowship programs and a specific, written research strategic plan	GPs	Academy	US
(Macfarlane et al. 2005)	General practices		In-depth interviews with 28 key informants in 11 UK research practices	Historical accounts of key events and processes relating to the development of research activity.	The researchers developed a 5 phase model of practice development in relation to research activity (creative energy, concrete planning, transformation / differentiation, consolidation and collaboration)	GPs	Primary Care	UK
(Mainous, III et al. 2000)	Family medicine		Survey of 124 chairs of departments of family medicine. Explored research infrastructure, productivity, and barriers to	Prioritization of research as a mission; number of funded research grants; publications; no of faculty staff conducting research.	Depts in research intensive institutions were larger, had more faculty on 'investigational tracks', and employed more research support staff and received more grant funding, but did not publish more papers than less research intense institutions.	Academic family practice	Academy	US

			productivity in academic family medicine in research intense and less research intense institutions.					
(Phillips & Russell 1994)	Counselling psychology		Survey of 125 graduate students to measure self-efficacy in research; research training environment; demographics and research productivity	Self efficacy in research; research training environment; productivity	Positive relationship between research self-efficacy and research training environment and b/w self efficacy and productivity. Relationship b/w research training environment and productivity was not significant.	Psychology	NS	NS
(Taniguchi & Johnson 1994)	Rehabilitation residents		Survey	The relationship between elective time, residency research requirement, mandatory research rotation and academic productivity.	Residents with 'research requirement' in their programme were 1.9 times more likely to submit abstracts ($p < 0.008$) and articles ($p < 0.014$).	Doctors	Academy	US
(Van et al. 1999)	Nursing researchers		Survey	Assessment of RNs knowledge, attitudes and practices of nursing research	Education and job title predicted knowledge and ability to perform research activities, but was unrelated to willingness to engage in research activities. Several	Nurses		US

				activities; and factors that support a research environment; identify facilitating and challenging factors to conducting research.	environmental factors were associated with knowledge of or willingness to engage in, and ability to perform research utilization activities.			
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