SPECIAL COMMUNICATION

Global Health and Primary Care Research

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A strong primary health care system is essential to provide effective and efficient health care in both resource-rich and resource-poor countries. Although a direct link has not been proven, we can reasonably expect better economic status when the health of the population is improved. Research in primary care is essential to inform practice and to develop better health systems and health policies. Among the challenges for primary care, especially in countries with limited resources, is the need to enhance the research capacity and to engage primary care clinicians in the research enterprise. These caregivers need to be an integral part of the research enterprise so the right questions will be asked, the results from research will be used in practice, and a scholarly and evidence-based approach to primary care will become the norm.

The challenge of developing research in primary care can be met only by creating a strong infrastructure. This will include strengthening academic departments, enhancing links to researchers in other fields, improving training programs for future primary care researchers, developing more practice-based primary care research networks, and increasing funding for research in primary care. A greatly increased commitment on the part of international organizations both within and outside of primary care is needed, in particular those organizations involved with funding research. We provide suggestions to improve the global primary care research enterprise for the benefit of the world's population. (J Am Board Fam Med 2007;20:518–526.)

A strong primary health care system is essential to provide effective and efficient health care in both resource-rich and in resource-poor countries. To improve equity in health it is vitally important to improve health services for the world's poorest and least healthy people.[1] Among the challenges for developing a strong primary care system, especially in countries with limited resources, is that of developing research capacity in primary care. This capacity is needed to inform practice and to improve health systems and policies. This paper reviews the evidence supporting the role of the primary care system in providing effective and efficient health care, the need for primary care research to be part of this system, a description of the primary care research, and recommendations to strengthen the primary care research enterprise.

The Strength of Primary Care Predicts a Population's Health Status

Studies of the value of health services have concluded that approximately half of the improvements in the health of populations in the past half century are attributable to health services, with other factors (geography, nutrition, public health measures) accounting for the remainder.[2–4] Within the last 2 decades, several researchers have shown that the strength of the primary care component of health systems is positively related to most common indicators of population health status, including birth outcomes, potential years of life lost, age-adjusted death rates, and age-specific mortality rates. The benefits are greatest for the causes of death that are especially amenable to primary care interventions, including stroke mortality, postneo-

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natal mortality, and years of potential life lost. These findings are consistent and found in international comparative studies.[5–9]

Early research showed that the 4 components of primary care (first contact access, long-term care focused on the patient rather than disease-focused care, comprehensiveness, and coordination) are important in determining health outcomes. First contact access is important in minimizing costs and improving outcomes.[10–12] Long-term, person-focused care improves problem recognition and accuracy of diagnosis and results in fewer adverse effects, less hospitalization, and lower costs.[13] Comprehensiveness is associated with increased possibilities for providing earlier needed medical care and the achievement of preventive practices and lower costs.[13] Coordination (through shared care and organized relationships between primary care practitioners and specialists) produces better outcomes.[13] Thus, the recent evaluations confirm that the combination of these features in primary care produces robust benefits that are found at international, national, and local levels.

Of special relevance to less economically developed countries is evidence that primary care produces equity.[8,14–16] One of the earliest studies done in developing countries showed that the distribution of primary care services is much more equitable than are those for health services in general.[17] In developed countries, primary care-oriented health systems (such as Community Health Centers in the United States) are associated with lower percentages of low-birth-weight infants and more years of "healthy life"[18,19]; areas with more primary care physicians have lower stroke mortality and postneonatal mortality rates, particularly if the areas also have large income inequalities.[20]

The Necessity of Research as an Integral Component of Primary Care

The need for primary care research was articulated by Kerr White in 1976.[21] A number of more recent analyses of primary care have echoed this need.[22–27]

There is increasing recognition that research not only *about*, but also *within*, primary health care is essential in all countries.[23,27,28] Research conducted in other settings and specialties has limited relevance because primary care (1) encounters health problems rarely managed in other sectors of health care; (2) manages clinical problems in an environment of low probability of major acute disease; and (3) involves the concurrent management of multiple problems.[29–33] In Australia, The Netherlands, the United States, and the United Kingdom there is clear recognition of the need to conduct research relevant to primary care[34–36]; there is no reason to think that the need is any less in countries with fewer resources. In fact, there are even more compelling reasons to conduct primary care research in developing countries where the potential to improve health is greater.

Primary care clinicians and their academic departments must play an increasingly important role in the primary care research process so that the right questions will be asked, the results from research will be used in practice, and a scholarly and evidence-based approach to primary clinical care becomes the norm.[25,27,37,38] Primary care research is essential for gathering evidence to improve health outcomes and to enhance the field of primary health care.

Primary care research can be described succinctly as "research conducted in the context of primary care." It includes (in overlapping categories) basic research to develop research methods in the discipline, clinical research to inform clinical practice, health services research to improve health service delivery, health systems research to improve health systems and policies, and educational research to improve education for primary care clinicians.[23,39] A few general examples under each of these categories include:

(1) Basic

This research includes studies that help develop the research tools for primary care. These tools include informatics, data-gathering methods, network operations, and other topics. For example, the generalizability of study results from primary care practices has been investigated and found to be generally good.[40,41] In addition, the development of methods to provide early warnings of adverse effects (such as unexpected signs and symptoms) may be facilitated by the use of coding systems appropriate for primary care, such as the International Classification for Primary Care.[42,43]

(2) Clinical

Clinical research in primary care includes studies of the natural history, epidemiology, and diagnosis of common clinical problems; studies of the manage-

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ment of common clinical problems; clinical trials in the setting of primary care[42,44]; and studies of the effects of context on health outcomes.[45] Some topics (eg, antibiotic use in otitis media) may best be studied using multinational approaches because patterns of care in individual countries may be too well established to allow for properly controlled trials.[46,47]

Primary care patients have a high prevalence of comorbidity,[29–31,33] making research that is oriented more to patients than to specific diseases a priority. Guidelines, most of which have been developed based on studies ignoring comorbidities,[33] need to be evaluated in the face of complex clinical realities.[48,49] Furthermore, primary care research could address the challenge of developing measures of health care quality and outcomes that go beyond disease-specific measures.

A set of emerging concerns may drive future primary care clinical research agendas. These could include studies of adverse effects such as antibiotic resistance and the costs and benefits of medical interventions.

(3) Health Services

This research includes studies designed to improve the processes of primary care, including medical informatics; the integration of primary, secondary and tertiary care; team development; and the role of patient–clinician relationships in different settings. Research into technologies is needed; for example, research about electronic health records, which supposedly support primary care.[50–52] In the United States, "best practices" research offers promise that primary care clinicians will be included in determining the best ways to organize care processes at local levels[53] and in studies that could lead to improving quality in different countries.[54,55]

(4) Health Systems

Health systems research includes studies of the relationship of health policies and political, social, and economic systems and their subsequent impact on the effectiveness of primary care services and health outcomes. Research to establish an appropriate balance between primary care and specialty care is especially needed. The ratios of various medical specialties to population vary widely[55,56]; the type and distribution of health professionals impacts health outcomes.[8,9] Additional research is needed to determine optimal primary care/specialty distribution and relationships.[57]

Inequity in health is defined as systematic and potentially remediable differences in health across population groups, whether demographic, geographic, or social.[15] A major goal of health systems is to reduce inequities in health. Research to determine what aspects of health care systems reduce health inequities is a high priority.[26,57]

(5) Educational

Educational research addresses educational programs and outcomes, including medical education and continuing professional development. Primary care educational research provides important information about the recruitment, training and retention of primary care professionals. It can provide information about how to promote careers in primary care, the skills needed by primary care clinicians, and how to promote the distribution of health professionals to areas of need. Finally, educational research will help to develop more effective strategies for continuing professional education as well as strategies to promote "self-reflective practice by clinicians."[26]

Promoting an Effective Primary Care Research Enterprise in Each Country

Van der Zee and colleagues[58] have identified conditions favorable for a robust research enterprise:

- a scientific association;
- peer-reviewed journal(s);
- defined population(s) resulting in population denominator(s) for practices;
- a system for linking primary care to other health care services;
- departments and chairs of general practice at universities;
- integration of educational and research centers;
- clinicians working in group practices or health centers;
- a certain degree of independence from the government; and
- financial support for practicing clinicians to conduct research.

Developing a primary care research enterprise requires a commitment of human and financial resources.[59,60] The difficulty in obtaining funding for

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infrastructure development and research time in both academic and clinical settings remains a problem worldwide. Even in resource-rich countries such as the United States, the amount of funding available for primary care research is very limited.[39] In resource-poor countries, the difficulties are even greater considering the unmet need for the development of effective primary care services and the very limited funding available for medical research in general.[61]

Even in resource-rich countries the emphasis on developing new technologies may lead to the neglect of issues that are more important in health care.[62] There is a disproportionate amount of international research funding for uncommon problems and little devoted to most common problems that plague most people of the world.[63] The Global Forum for Health Research has called this disproportionate funding of research "the 10/90 gap," referring to the fact that only approximately 10% of research resources are directed to address 90% of the health problems of the global population.[61] However, even though the Forum works to address the need for a redistribution of research funding, they fail to articulate the need for an effective infrastructure for primary care research, focusing instead on specific disease and policy issues. A robust primary care research enterprise in all countries would address the problems identified by the Forum, including communicable diseases, the translation of research findings into personal and public health care, and the use of research to develop effective health policies.

It is our opinion that an effective primary care research enterprise will include the following elements:

(1) Presence in Academic Centers

University primary care departments are essential in both resource-rich and resource-poor countries. The demands on academic institutions for the recruitment and training of health professionals has led to a focus on undergraduate education and specialty training, often to the neglect of research. Successful examples of primary care development demonstrate the importance of research as the driving force needed to guide practice, teaching, and training.[27,64–66] Many economically developed countries (eg, Italy, France, and Japan) have very poorly developed academic primary care programs and will need to develop academic primary care from the grass roots. However, some less economically developed countries (eg, Cuba and Costa Rica) have excellent academic primary care training programs, although the number is limited.

(2) Collaborations with Other Disciplines

Primary care, by its comprehensive nature, relates to other disciplines both inside and outside of medicine (eg, sociology, anthropology, health economics, and industrial engineering); primary care researchers benefit through collaborations with other disciplines. For example, collaborations can facilitate exploration of the needs and perceptions of patients, the ways they access and use health care services,[26,27] and issues in patient safety.[67] The primary care research environment is enriched by researchers who have a wide range of professional skills and who are motivated and able to work with primary care researchers. At the same time, these academic researchers must understand the need to collaborate with community clinicians who can help articulate the important questions and apply the answers to practice.[36]

(3) Linking Research to Practice

The ultimate goal of primary care research is to provide new information to health professionals, patients, and communities to improve health outcomes. With medical information accumulating so rapidly, it is important to develop efficient mechanisms to link research to practice so that care reflects recent and relevant findings. Electronic medical records and computerized medical information systems make it possible for rapid dissemination of findings that have important practice implications but may also pose new problems that must be explored.[50] Primary-care research networks (PCRNs) offer the potential for the adoption of new findings.[27,44,53]

Although these conditions are not easy to attain, especially in developing countries, the presence of at least a few will facilitate the development of primary care research. Worldwide, there has been some success, although limited.[38] All of these conditions can be addressed through clinician–researcher training, primary care research in academic centers, and community practitioner involvement. These all are dependent on the development of global support for research in primary care.

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Despite the problems, academic primary care research is well developed in many countries, such as Canada, Spain, The Netherlands, the United Kingdom, and the United States, with a significant number of clinician-researchers trained at the doctoral level and a robust output of scientific publications. Australia has allocated $50 million for a program of Primary Health care Research Evaluation and Development.[68] These successes provide examples to serve as role models for other countries.[69]

Strategies to Strengthen Primary Care Research in Less Economically Developed Countries

Develop Training Programs

The education of future primary care academic leaders about the need to develop their research expertise is obviously important; they also need the skills to link research with primary care clinicians and patients in their communities. To meet the need for primary care, a number of advanced training schemes have been developed to combine primary care clinical training with research. Efforts are underway to use resources in the developed countries to support research training in developing areas.[69] These training programs are designed to develop the future leadership of primary care research, but the lack of ongoing support for research may inhibit the success of these plans. Primary care clinicians who receive research training are often under great pressure to provide patient care and education and have little time or energy for essential research.[35]

One of the most successful methods to transfer research expertise is direct supervision and transfer of advice through mentoring.[27] Mentoring can be on an individual basis and can electronically link institutions across national borders[70] or geographic regions.[28,71] This ability to transcend regional barriers will enable mentoring to become an important way to build primary care research capacity in countries with various stages of economic development.

Encourage Medical Schools to Develop Research in Primary Care Departments

The Kingston Conference[27] reviewed the needs of research development and concluded that there were no major differences between low, medium, and high income countries. "Development" should therefore be seen in the light of the structure of the academic health care institutions, their links with community clinicians, and their ability to provide mentorship for new primary care researchers. Strategies for promoting primary care research in less economically developed countries should take into account the fact that clinicians are often overwhelmed by clinical demands in chaotic systems in which 80 to 100 patient visits per day is common. There are some examples where PCRNs have had an impact on health in developing countries by applying simple recording methods.[72–74] On a larger scale, PCRNs' epidemiologic analyses could improve their countries' responses to community health needs and could lead to the development of more efficient and effective primary health care teams. In all cases, support needs to be directed at the needs of the country rather than driven by the priorities of external and commercial entities.

Encourage the Participation of Primary Care Clinicians

The main reasons clinicians decide to participate in research is to improve the quality of their own work and to make their work more rewarding despite a potential loss of income.[60] The participation of primary care physicians will enable a better understanding of the health problems in primary care and lead to better diagnostic and therapeutic performance.[75] Participation in research can increase clinicians' professional confidence and self-esteem and may also improve the status of primary care as a career choice.[76] PCRNs play a key role in linking community practitioners with academic institutions.[27,44] The most established PCRNs have strong university links and often have professional societies and practitioner groups actively involved.[77] The International Federation of Primary Care Research Networks (IFPCRN) is working to support these links among both academics and physicians in practice.[78] Community clinicians' involvement can take various forms. The most advanced is that of the clinician-researcher, but practitioners with less training or interest can also facilitate research by engaging with academicians to define questions and methods, collecting data, and opening their practices to academic researchers.

Applying research findings to patient care is another form of participation in the research process and includes critical appraisal,[54,79] systematic review,[80] and guideline development.[81] This ap-

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proach has an important spin-off in that it identifies deficiencies in scientific knowledge[82] and can direct studies to areas with a high priority in terms of patient care. Some proposals in less economically developed countries are linking continuing education with acquisition of research data.[83]

Develop a Commitment for Support from International Organizations

Given the great impact of primary care on society's health, many stakeholders stand to benefit from a robust primary care research enterprise that can improve the quality, cost effectiveness, community relevance, and equity of primary care services in all countries. At the national level, countries such as Australia, Canada, The Netherlands, the United Kingdom, Spain, and the United States are recognizing the need to develop research in primary care. In the United Kingdom, governmental support was stimulated by the Mant report[84] and more recently in the United States through the National Institutes of Health Clinical and Translational Science Awards programs.[85]

Primary care clinicians and academics continue to be challenged with the task of convincing international organizations to support the development of research as an integral part of the primary care system. For example, a 2003 report from the World Health Organization makes essentially no mention of the need for research in primary care,[86] although this unfortunate attitude may be changing.[87] The World Health Organization, the Global Forum for Health Research, and Wonca have the potential to become powerful advocates to strengthen primary care research. International health research organizations such as the World Health Organization, the IFPCRN, or the Research Forum could provide resources for translating into English the results of excellent primary care research now being published in countries like Spain. There is an urgent need for international primary care organizations such as Wonca to become more proactive in advocating primary care research; fortunately there is some evidence that this is happening.[69]

Conclusions

There is compelling evidence that the strength of the primary care system in a region or country predicts the health status of the population. There is a growing awareness that research in primary care is needed for a strong primary care system to provide excellent clinical (and population-based) care, to develop effective health systems and policies, and to educate future primary care professionals and researchers. The absence of an effective primary care research infrastructure in most countries is impairing the development of local and national health care systems that have the potential to bring about dramatic gains in improving the health of the world's population. Recognition of the pivotal role that a strong primary care system plays in the health of populations will form the basis for increasing international support for primary care research.

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