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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. To improve equity in health it is vitally important to improve health services for the world’s poorest and least healthy people. 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. 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-
natal mortality, and years of potential life lost. These findings are consistent and found in inter-
national 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 im-
portant in determining health outcomes. First con-
tact access is important in minimizing costs and 
 improving outcomes.10–12 Long-term, person-foc-
cused care improves problem recognition and ac-
curacy 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 devel-
oped countries is evidence that primary care pro-
duces equity.8,14–16 One of the earliest studies done 
in developing countries showed that the distribu-
tion of primary care services is much more equita-
ble than are those for health services in general.17 
In developed countries, primary care-oriented 
health systems (such as Community Health Cen-
ters 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 ar-
eas 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 
alyses 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 con-
ducted 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 dis-
 ease; and (3) involves the concurrent management 
of multiple problems.29–33 In Australia, The Neth-
erlands, the United States, and the United King-
dom there is clear recognition of the need to con-
duct research relevant to primary care34–36; 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 de-
partments must play an increasingly important role 
in the primary care research process so that the 
right questions will be asked, the results from re-
search 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 pri-
mary health care.

Primary care research can be described suc-
cinctly as “research conducted in the context of 
primary care.” It includes (in overlapping catego-
ries) 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 re-
search to improve education for primary care cli-
nicians.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 op-
erations, and other topics. For example, the gener-
alisability of study results from primary care prac-
tices 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 Interna-
tional Classification for Primary Care.42,43
ment of common clinical problems; clinical trials in the setting of primary care; and studies of the effects of context on health outcomes. Some topics (e.g., 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.

Primary care patients have a high prevalence of comorbidity, 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, need to be evaluated in the face of complex clinical realities. 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. 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 and in studies that could lead to improving quality in different countries.

(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; the type and distribution of health professionals impacts health outcomes. Additional research is needed to determine optimal primary care/specialty distribution and relationships.

Inequity in health is defined as systematic and potentially remediable differences in health across population groups, whether demographic, geographic, or social. 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.

(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.”

Promoting an Effective Primary Care Research Enterprise in Each Country
Van der Zee and colleagues 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. The difficulty in obtaining funding for
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 borders20 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 Conference27 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 PCRN have had an impact on health in developing countries by applying simple recording methods.72–74 On a larger scale, PCRN’s 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 PCRN play a key role in linking community practitioners with academic institutions.27,44 The most established PCRN 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-
proach has an important spin-off in that it identifies deficiencies in scientific knowledge 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.

**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 and more recently in the United States through the National Institutes of Health Clinical and Translational Science Awards programs.

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, although this unfortunate attitude may be changing. 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.

**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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