

**ADVISORY COMMITTEE ON
INTERDISCIPLINARY,
COMMUNITY-BASED LINKAGES (ACICBL)**

**AN EXAMINATION OF
THE HEALTHCARE
WORKFORCE ISSUES IN
RURAL AMERICA**

EIGHTH ANNUAL REPORT
to the
Secretary of the United States
Department of Health and Human Services
and the
United States Congress

September 2008

**The views expressed in this report are solely those of the
Advisory Committee on Interdisciplinary,
Community-Based Linkages
and do not represent the perspectives of the
Health Resources and Services Administration
nor the
United States Government.**

Advisory Committee on Interdisciplinary, Community-Based Linkages

Eighth Annual Report

TABLE OF CONTENTS

Acknowledgements	4
About the Committee.....	5
Committee Members.....	6
Federal Staff Support and Involvement	8
Introduction.....	9
Chapter 1. Concept Paper by Dr. Mary Wakefield : Enhancing Health Care for Rural Populations through Interdisciplinary Training and Quality Improvement	13
Chapter 2. Concept Paper by Dr. Gary Hart : Rural Health Workforce Status and Issues	36
Chapter 3. ACICBL Recommendations to the Secretary and the Congress	66
Chapter 4. Conclusions.....	76
References.....	78
Appendix A. Biographical Notes – Authors of Concept Papers.....	80
Appendix B. Biographical Notes – Experts Providing Guidance on the Report.....	82

ACKNOWLEDGEMENTS

The Advisory Committee on Interdisciplinary, Community-Based Linkages (ACICBL) has the primary responsibility to provide advice and recommendations to the Secretary and the Congress regarding policy, program development and other matters of significance concerning activities under Section 756, Title VII, part D of the Public Health Service Act. Each year, the Committee selects a topic reflecting a major issue within the health care system that is relevant to the mission of the Bureau of Health Professions (BHP) and supports the legislative intent of the Public Health Service Act. The selected topic is analyzed in depth by the ACICBL and results in a report with recommendations. The Committee examined Health Workforce Issues in Rural America this year.

This report is the culmination of the efforts of many individuals who provided their expertise to the Committee during the three required formal meetings, one of which was held in Rockville, Maryland on May 7 – 9, 2008 and the other two as scheduled conference calls on July 16 -17, 2008 and September 10 -11, 2008. In particular, appreciation needs to be extended to the authors of two invited papers that provided critical insight into the workforce issues in rural America. The papers authored by Mary Wakefield, Ph.D., and Patricia Moulton, Ph.D., Center for Rural Health at the University of North Dakota and Gary Hart, Ph.D., Arizona Rural Health Office, University of Arizona appear in their entirety as chapters in this report.

This report was informed by presentations from several experts who provided their knowledge and expertise on a broad array of issues in rural health care. These individuals and topics are noted elsewhere in the report but it is important to emphasize that the format of the committee meetings included both hearing these presentations and interacting with these expert presenters. The recommendations in this report were significantly influenced by the richness and depth of these conversations with the presentations. As such, the committee appreciated the opportunity to learn from these knowledgeable individuals.

Finally, the report has benefited from the capable assistance of several Federal staff. Specifically, Marcia K. Brand, Ph.D., Associate Administrator, BHP, gave a key presentation on the rural health delivery system in the United States that served as a framework for incorporating testimony presented to the Committee from other experts. Additionally, the Committee must recognize the key contributions of Louis D. Coccodrilli, Designated Federal Official, Health Resources and Services Administration, Bureau of Health Professions, Division of Diversity and Interdisciplinary Education and CAPT Norma J. Hatot, Senior Nurse Consultant, United States Public Health Service. The Committee could never have completed its charge without the support and hard work of these dedicated professionals. I am also grateful for the support of Adriana Guerra, Fellow, Association of Schools of Public Health, who was temporarily assigned to the Federal office.

Sincerely,

Stephen L. Wilson, PhD, Chair

Advisory Committee on Interdisciplinary, Community-Based Linkages
Associate Dean, College of Medicine and Public Health
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ABOUT THE COMMITTEE

The Advisory Committee on Interdisciplinary, Community-Based Linkages (the Committee) was created in 1998 under the Authority 42USC 294F, Section 756 of the Public Health Service Act. This Committee has specific duties to include providing advice and recommendations to the Secretary regarding policy and program development and other matters of significance concerning activities under Section 756, Title VII, Part D of the Public Health Service Act. Additionally, the Committee prepares and submits an annual report to the Secretary; the Committee on Health, Education, Labor and Pensions of the Senate; and the Committee on Energy and Commerce of the House of Representatives that describes its activities, findings, and recommendations. Specifically, Section 756 directs that:

- The Secretary of the Department of Health and Human Services shall establish an advisory committee, known as the Advisory Committee on Interdisciplinary, Community-Based Linkages (ACICBL).
- The Secretary shall appoint the members of the Committee from a pool of qualified applicants who are health professionals from schools of the types described in Sections 751 through 755, inclusive of Area Health Education Centers; Geriatric Training for Physicians, Dentists, and Behavioral/Mental Health Professionals; Rural Interdisciplinary Training; and Allied Health and Other Disciplines.
- The Secretary shall ensure a fair balance between the health professions. At least 75 percent of the appointments shall be health professionals representing a broad geographic spectrum, a balance between urban and rural members, and an adequate representation of women and minorities.
- The Secretary shall ensure the appointment of members based on their competence, interest, and knowledge of the mission of the professions involved.

The Health Resources and Services Administration (HRSA); Bureau of Health Professions (BHP_r); Division of Diversity and Interdisciplinary Education (DDIE), formerly the Division of State, Community and Public Health is responsible for managing all aspects of this Committee. The Committee is legislatively mandated to convene at least three times annually to discuss relevant issues that impact the Title VII training programs and associated research. Frequently, this effort involves convening experts and consultants from the field for dialogue with the public always being invited. More recently, the Committee has consulted with the other advisory committees within BHP_r as a strategy to maximize resources and opportunities and avoid duplication.

The Committee was initially chartered on March 24, 1999. The charter was renewed on March 22, 2001; March 23, 2003; March 1, 2005; and March 23, 2007.

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INTRODUCTION

Health care professional shortages, insufficient numbers of faculty members, demographic changes in the rural population, a strained delivery system, and emerging health care needs affecting quality of care combine to make unprecedented demands on the rural health care system. This report examines the supply, access, quality of care, and demographic issues that are impacting the rural health care delivery system, and provides specific recommendations identified by the Advisory Committee on Interdisciplinary, Community-Based Linkages (the Committee) to address these rural health concerns.

Chapter One is comprised of a concept paper from rural health care experts Dr. Mary Wakefield and Dr. Patricia Moulton. That document centers on specific health care issues pertaining to the rural population and offers potential solutions. Chapter Two summarizes some of the relevant research from academician Dr. Gary Hart regarding the status of the rural health workforce. Chapter Three offers a detailed discussion of the recommendations and findings negotiated by the members of the Committee after dialogue with the several invited consultants, whose bios can be found in Appendix B. Chapter Four provides the summary conclusion specific to the steps necessary to address these rural health concerns.

RURAL HEALTH CARE WORKFORCE SUPPLY

Health care workforce shortages are a growing problem nationwide; the crisis is most severe in small, isolated rural communities (Hart, 2008). By virtue of their small population size and scale, the loss of just one provider in a rural community profoundly impacts residents' access to care. Despite modest improvements in national physician to population ratios over the past two decades, shortages of primary care physicians and specialists (including obstetricians/gynecologists, general surgeons, and psychiatrists) persist in rural areas.

Shortages are expected to worsen as practicing physicians retire and the number of residents in the pipeline who choose to practice and/or are trained to practice in rural areas diminishes. The particular challenges of practicing in a rural setting, including high caseloads, long hours on call, isolation from colleagues, lack of easily accessible continuing education opportunities, lack of employment opportunities for spouses, and heavy school loan debts, threaten to further diminish the supply of rural general practitioners (National Advisory Committee on Rural Health and Human Services - NACRHHS, 2008).

A severe dearth of mental and oral health care professionals creates troubling access problems in rural areas. Rural counties without large rural cities have an average of 30 dentists per 100,000 persons, compared to 60 per 100,000 in urban areas (Hart, 2008). Sixty percent of rural Americans live in mental health professional shortage areas; 90 percent of all psychologists and psychiatrists, and 80 percent of social workers practice in metropolitan areas. These health professional shortages contribute to rural Americans entering care late in the course of their disorders – with more advanced symptoms – resulting in the need for more intensive and expensive interventions.

In addition to the shortage of physicians, dentists, and psychologists, rural areas have an inadequate supply of nurses, physician assistants, pharmacists, and other allied health professionals, all of whom play a critical role in rural health care delivery. Recent trends indicate that an increasing number of nurses residing in rural areas are commuting to urban cities and larger communities to work (Hart, 2008). Also, a longstanding shortage of nursing faculty has dramatically increased rejection rates for nursing school applicants, thereby negatively impacting the future supply of nursing graduates (Fraher testimony, May 2008). Finally, recent policies that provide disproportionate support for nurses pursuing a four-year Baccalaureate Degree may further detract from the nursing supply in rural facilities, since these facilities are primarily staffed by nurses with two-year Associate Degrees (Skillman et. al., 2008).

Current Federal policies regarding training of non-physician health care professionals do little to ameliorate the shortage problem. Nurses, physician assistants, and other allied health professionals receive less Federal assistance for training despite the fact that they face many of the same challenges as rural physicians (NACRHHS, 2008). Additionally, continued cuts in Title VII primary care training grants and declining match rates for family practice residencies result in fewer generalist physicians overall.

Recruiting and retaining an adequate supply of rural providers remains difficult. The Institute of Medicine (IOM) has found that a renewed and vigorous effort must be made to enhance the health professions workforce in rural areas (IOM 2003). Failing to invest in the recruitment, retention, education, and training of rural providers will have dire consequences on rural health care, including increased health disparities and an associated increase in the cost of caring for the Nation's vulnerable populations. The Title VII Programs play important roles in the training and education of the Nation's provider base. They can also play a critical role in mitigating these negative ramifications.

ACCESS TO CARE IN RURAL SETTINGS

There is a general lack of access to core health care services, including community-based primary care, emergency medical services, hospital care, long-term care, mental health and substance abuse services, oral health care, and public health services in most rural areas across America. While several inter-related factors impede access to health care for rural residents, the inadequate supply of health care providers discussed in the previous section is a major contributor to this problem.

Additional factors impacting access to care include rural geography and the economic status of rural residents. Inhabitants of small, isolated rural communities face long distances that they may be unwilling or unable to travel in order to seek needed medical care. Rural areas, as compared to urban settings, are also characterized by higher rates of unemployment and underemployment, as well as a higher percentage of poor, uninsured, and underinsured persons (Hart, 2008). All of these factors negatively impact access to care in rural areas and require thoughtful attention while addressing rural health concerns.

QUALITY OF CARE

In the report, *Quality Through Collaboration: The Future of Rural Health* (2005), the IOM noted that, although evidence pertaining specifically to quality of care in rural areas is sparse, "what does exist corroborates the general finding that [...] the level of quality falls far short of what it should be."

Previously noted hardships associated with practicing in rural areas make it difficult for rural communities to attract and retain qualified health care professionals. The resulting shortages create obstacles for rural providers interested in participating in continuing education opportunities that require travel or time away from patients.

Other factors that impact quality of care include care coordination, delivery of interdisciplinary, team-based care, knowledge of quality improvement science, and the use of health information technology (HIT) and electronic health records (EHR). Care coordination has been shown to improve health outcomes and reduce costs, but it can be difficult to effectively implement under the kind of conditions that typify rural settings, such as great physical distances between providers and blurred practice boundaries due to provider shortages. Currently, few dedicated State or Federal funding streams exist for interdisciplinary education. Training alone may not be enough to ensure that providers are prepared to practice interdisciplinary, team-based care in rural settings.

Quality improvement efforts rely, in part, on the use of HIT, which is less widely used in rural settings as compared to metropolitan areas. HIT can contribute to a reduction in medical errors by ensuring that providers have access to current patient information and decision supported technology for clinical decision making. A number of obstacles have slowed widespread adoption of HIT in rural settings including limited capital and infrastructure for HIT development, lack of workforce expertise, and difficulty obtaining community buy-in (NACRHHS, 2008).

HEALTH DISPARITIES AND CHANGING POPULATION DEMOGRAPHICS

The immense need for coordinated, high quality care in rural areas is projected to grow based on changing rural population demographics. Relative to urban populations, rural residents have higher rates of chronic disease, more fatalities, and higher rates of smoking and obesity – both predisposing factors for chronic illnesses (Wakefield & Moulton, 2008). Moreover, changing rural demographics place unprecedented demands on the rural health care workforce, and those demands are expected to escalate in the coming years.

Across the country, the population is aging. In fact, national projections estimate that by the year 2030, 19.3 percent of the U.S. population (70.3 million persons) will be 65 years or older, compared to just over 12 percent (37 million persons) in 2006. The population of Americans over age 85 is also projected to increase from 5.3 million in 2006 to an estimated 8.9 million in 2030 (Federal Interagency Forum, 2008). A disproportionate number of these older Americans live in rural areas. Studies show that there is a greater prevalence of chronic conditions and complex co-morbidities among the elderly than in younger populations. In 2000, nearly half of all Medicare beneficiaries had three or more chronic medical conditions and one-fifth had five or more conditions (Anderson, 2002). The projected growth of the rural elderly population promises to create an even greater demand for geriatricians and health care teams who are well versed in chronic illness care than what already exists.

Recent immigration patterns have resulted in unprecedented growth in the rural minority population. Racial and ethnic minorities now make up 18.3 percent of all nonmetropolitan residents with Hispanics representing the fastest growing segment of the rural population (Economic Research Service, 2007). In the 1990s, the growth of the Hispanic population in rural areas contributed to an overall rural population growth of 10 percent. Over 100 nonmetropolitan counties that would have experienced declines in population in those years instead remained stable

or grew because losses in original populations were balanced by a growth in new Hispanic populations (NACRHHS, 2008). Many of these immigrants lack a high school education and have limited English proficiency. They also tend to be young adults who are likely to form families and have children, thereby increasing the number of individuals needing health care services. All of these factors translate into greater demand for a diverse, culturally competent health care workforce, as well as an increased need for prenatal and pediatric care in rural areas.

OPPORTUNITIES FOR AN IMPROVED RURAL HEALTH CARE SYSTEM

Some aspects of rural health care systems may actually facilitate the implementation of quality improvement measures. Health care systems in rural areas are typically smaller and less complicated than larger urban systems. As such, they may be more conducive to implementing and testing demonstration projects for innovative practice models, like the patient-centered medical home. A rural community culture that encourages networking and coordination at the clinician level across disciplines may lay the groundwork for building inter-professional partnerships and a team-based care approach (Wakefield & Moulton, 2008). Further, significant physical distances between patients in isolated rural areas and health care professionals provide an impetus to support the practice of telemedicine, while limited training and continuing medical education opportunities for health care professionals argue for more support for teletraining.

THE ROLE OF TITLE VII PROGRAMS IN IMPROVING RURAL HEALTH CARE

The Title VII interdisciplinary, community-based training grant programs are an integral part of the rural health safety net system. They provide an ideal mechanism for increasing the delivery of quality health care services to individuals residing in rural areas, as well as for developing the educational infrastructure to address the unmet needs of these persons. Specifically, the training programs and grants within the Health Resources and Services Administration, Bureau of Health Professions have the potential to: expand access to training opportunities for rural providers; develop provider skills and knowledge regarding interdisciplinary and team-based care and other core competencies outlined by the IOM; implement quality improvement measures; and ensure an adequate supply of diverse, highly qualified health care professionals committed to serving in rural areas.

The Committee encourages sufficient funding for rural interdisciplinary, community-based training initiatives and the other Title VII programs as a contributing strategy to alleviating the crisis in the delivery of quality health care to the Nation's rural populations. The Recommendations presented in Chapter Three describe the specific mechanisms by which BHP can address the rural health care issues of supply, access, quality of care, and demographic changes, thereby supporting its vision of improved access and enhanced quality of health care across the Nation.

CHAPTER 1. CONCEPT PAPER

ENHANCING HEALTH CARE FOR RURAL POPULATIONS THROUGH INTERDISCIPLINARY TRAINING AND QUALITY IMPROVEMENT

By Mary K. Wakefield, PhD, RN, FAAN and Patricia Moulton, PhD

TABLE OF CONTENTS

Purpose / Overview.....	14
Background	14
Rural Environments, Communities and Populations	15
Rural Health Care Delivery System Characteristics	19
Improving Rural Health Care Quality through Competency Development: Interdisciplinary Team Practice and Quality Improvement	24
Implications for Federal Programs	27
Conclusions	29
Recommendations.....	31
References	32

Improve the health status of the population by providing (a) ...health workforce that provides the highest quality health care for all (Mission statement, Bureau of Health Professions, HRSA).

Purpose/Overview

Rural health care, including the rural health workforce, has often been at the margins of national efforts to strengthen health care quality. Specific to the rural workforce, Federal programs have tended instead to focus on the challenge of fielding an adequate supply of rural providers. While workforce supply is clearly important, creating high performing systems is also contingent on a workforce competent to deliver high quality care tailored to the characteristics of rural health care settings and the needs of rural populations.

This paper explores trends in health care broadly as well as specific characteristics of rural populations and health care systems that have implications for the education and practice of the rural health workforce. Targeted attention is given to two workforce competencies: interdisciplinary team care and quality improvement. Both of these workforce competencies are essential to the attainment of high quality health care in rural settings. The paper concludes with recommendations about how these competencies can be supported through public policies and programs, including implications for programs operated through the Bureau of Health Professions Division of Diversity and Interdisciplinary Education (DDIE). For purposes of this paper, terms referring to the health care workforce (e.g., clinicians) are meant to be inclusive of all health care providers in rural areas and health care teams are inclusive of patients and family caregivers.¹

Background

The United States is confronting a set of contemporary health and health care challenges with numerous and complex elements. Multilayered health professions education and health care delivery systems face an array of demands, including expectations for responsiveness in meeting current and emerging health care access and quality needs. For example, demands placed on the Nation's health care infrastructure include caring for culturally diverse populations with different language and health care customs and markedly increased numbers of individuals seeking care for chronic conditions (Greer, 2008; Medicare Payment Advisory Commission, 2008). An aging population also adds expectations for training and deploying the health workforce to deliver care specific to this population that is accessible, efficient and of high quality.

The current health care system, while reflecting high performing components in both rural and urban areas, overall is underperforming (Cantor, Schoen, Belloff, How, and McCarthy, 2007). Deficiencies in the health care sector result in millions of uninsured, poor care quality, escalating costs, and inadequate value for the amount of resources invested. Frequently cited work by McGlynn shows that only about half the time, for a set of common conditions, Americans receive the care that evidence indicates they should. Geographic variation in care quality also exists. In this environment, sentiments such as the following are becoming increasingly common: "The US health care system, both public and private, is in imminent danger of collapse...the public health system is faring even worse than the private health care system" (Health Research and Educational Trust, 2006, p.6). This combination of issues- compromised access to care of variable quality coupled with markedly increasing costs- challenges public policymakers. To begin to address some of these concerns, policy responses include linking quality and payment in new 'pay for

performance' models that are now being infused into major public programs including Medicare and Medicaid (Centers for Medicare and Medicaid, 2008). Emerging approaches to solving this set of thorny challenges, including driving performance improvement through structural changes in payment policy, have major implications for both the delivery of health care services and the preparation of the workforce providing these services.

Beyond public policymakers, the business community, health care providers, foundations, and others are also advancing solutions with direct and indirect implications for the health care workforce. Reform strategies are being offered by an array of special interest groups (e.g., the American Hospital Association, AARP) and influential public and private organizations such as the Medicare Payment Advisory Commission, the Commonwealth Fund, and the Institute of Medicine (IOM). For example, in their series of reports on quality, the Institute of Medicine (IOM) documented fundamental problems with the U.S. health system. The report *Crossing the Quality Chasm*, (2001) called for major changes in applying evidence, improving care quality, using technology, and preparing the health care workforce. The report cited the health care workforce as an essential element in needed health system transformation and asserted that meeting six priority national aims (safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity) requires much more of health providers. New demands on workforce education programs include ensuring the acquisition of competencies in the areas of interdisciplinary teamwork, quality improvement, evidence-based practice, patient-centered care, and informatics (IOM, 2003).

Achieving efficient, high quality care is predicated not only on health care system redesign but also on the redesign of the skill and knowledge sets brought to these organizations by the health care workforce. As policymakers and others advance new performance expectations for health care delivery systems, require expanded reporting publicly of this performance, and titrate associated reimbursement, the competencies of the health care workforce acquire even more importance.

$$\begin{aligned} & \textit{Redesigned health workforce education} + \textit{redesigned health care systems} \\ & \qquad \qquad \qquad = \\ & \qquad \qquad \qquad \textit{Improved patient outcomes} + \textit{improved payment} \end{aligned}$$

State-of-the-art health professions education that produces clinicians well prepared to contribute to high performing health care organizations is increasingly relevant not only to the health of populations, but also to the financial health of the organizations delivering that care, and to the stakeholders paying for care. Consequently, helping key stakeholders to understand the link between health care quality and the preparation and practice of the health care workforce is important. It is against this backdrop of highly complex and far reaching issues, that rural health care and the rural workforce are considered.

Rural Environments, Communities and Populations

While often thought of as static and uniform, there is significant variation and dynamism across rural America. The differences in rural places, populations and even health care delivery systems can be as varied as the rural images that surround them, ranging from flat prairie land to mountain peaks and valleys. In fact, it is not uncommon to hear the following observation from people working on issues specific to rural health care: “when you’ve seen one rural community or rural hospital, you’ve seen one.”

To distinguish rural areas in order to better understand their characteristics, the Federal government and other entities employ a variety of definitions. These definitions tend to reflect characteristics such as population density (e.g., size of towns), distance (e.g., proximity to large population centers) and travel time. Two commonly used definitions of rural are: 1) the nonmetropolitan versus metropolitan county based definition from the Office of Management and Budget; and 2) the census tract-based definition produced by the U.S. Bureau of the Census (National Advisory Committee on Rural Health and Human Services, 2008). No one definition captures all key characteristics of rural areas and each definition reflects both strengths and limitations. Most important to note is that Federal programs operate under a variety of rural definitions that can be more or less inclusive of populations and geographic areas.² Consequently, careful consideration should be given when selecting and applying rural definitions to policies and programs. Each definition has a differential impact in the availability and reach of Federal programs and policies to rural areas (Coburn, MacKinney, McBride, Mueller, Slifkin, and Wakefield, 2007).

In terms of both total number and as a proportion of the total U.S. population, the population residing in non-metropolitan counties across the Nation has decreased significantly (2,398 nonmetropolitan counties in 1987 vs. 2,051 counties in 2005). This trend is accompanied by national shifts toward suburbanization (National Advisory Committee on Rural Health and Human Services, 2008). The out-migration of young adults from many rural areas tips the average age of rural residents toward an overall older population. This phenomenon, coupled with retirees migrating to rural areas, has contributed to projections of a tripling of elderly in non-metropolitan areas (i.e., a six percent elderly growth rate from 2000 - 2010, and an 18 percent growth rate from 2010 - 2020 (Cromartie and Gibbs, 2007). Rural elderly tend to be less healthy, have less formal education, have lower incomes, have fewer transportation options and are more isolated than their urban counterparts (National Advisory Committee on Rural Health and Human Services, 2008; Institute of Medicine, 2008). This demographic shift presents an array of significant implications for health care services in rural communities. For example, access to specialty services often requires travel and available public transportation for the rural aged. In some rural areas, new services (with associated health care workforce implications) such as cardiac and stroke rehabilitation, are replacing services such as obstetrics. Since older adults are more likely to have chronic illnesses and disabilities, and have greater difficulty with activities of daily living (Hawes, Phillips, Holan, Sherman, and Hutchison, 2005; Brand, 2007) clinicians with expertise in chronic care management are especially important to meet the health care needs of the expanding numbers of rural elderly. However, the IOM notes (2008) that education and training “of the entire health care workforce with respect to the range of needs of older adults remains woefully inadequate” (p. S-1, 2008). Given rural population demographics and rural workforce supply and competencies, this disconnect is magnified in rural areas.

Tied to the large proportion of elderly in rural areas and to lower average incomes, health care financing tends to draw more heavily on payment adequacy of the Medicare program, while significant need for long-term care drives financial reliance on the Medicaid program; two programs historically viewed as underpaying providers for services (Meit, 2006). It is common to find both acute and long-term care services co-located in a single rural health care facility, making the financial viability of the organization heavily tied to the adequacy of public payment policy.

Certain behaviors that predispose populations to chronic illnesses (e.g., higher rates of alcohol consumption and obesity) are more common across rural populations (Centers for Disease Control and Prevention, 2001). In fact, as younger populations are impacted by chronic disease (e.g.,

diabetes) the need for both health care services and related expenditures will increase across larger segments of the life cycle. This will be particularly significant in rural regions of the country where population behaviors predispose toward chronic disease and where associated health care needs will place even greater demand on an already fragile rural health care infrastructure and thinly deployed workforce. To blunt upward trends in chronic illness, population health, illness prevention and wellness efforts are needed, all of which require associated health workforce expertise; including underlying competencies to deliver this care through interdisciplinary team approaches.

Forging connectivity between health care systems and public health is strongly advocated (Institute for Healthcare Improvement, 2007). However, getting agreement on population health policies will be challenging (i.e., ways to coordinate across sectors, agreement on population health measures, financial incentives) (Kindig, 2008). While it is a complex undertaking, re-orientating efforts to include a focus on population health can drive the reach of health care efforts to extend beyond the bricks and mortar of rural health care facilities. Implementing this orientation requires a different interdisciplinary team composition including other community representatives (e.g., business, school systems) (IOM, 2005). Creating links between health care and non-health care sectors to improve population health, while important, is a highly complex expectation (Evans and Stoddart, 1990). However, given rural community size, familiarity of community members and leaders with each other, and defined community boundaries, rural communities are perhaps most suited to serve as demonstration sites for emerging population health and training initiatives. While rural community characteristics can facilitate these important cross-sector linkages, in most rural locales this public and population health expertise needs to be markedly strengthened. Consequently, this orientation has implications for the educational content of rural health workforce training programs.

Other population characteristics relevant to the rural health care workforce and its associated competencies are changes in racial and ethnic minority populations, which currently comprise over 18 percent of the total rural population. Overall, Blacks comprise the largest minority group across rural areas, while Native Americans constitute the largest minority group in some rural States. However, the greatest rural minority population growth is in Hispanic and Asian minority groups (Economic Research Service, 2007). This growth tends to bring a younger workforce to some rural communities which increases demand for prenatal and child care in these rural areas as well as offer the potential for economic revitalization.

While rural America is commonly viewed through an agricultural lens, close to 94 percent of rural populations are engaged in other areas of the labor force, including manufacturing and the service sector (Hamilton, Hamilton, Duncan, and Colocousis, 2008). Employment rates differ between urban and rural areas with about 40 percent of rural residents working in full-time jobs compared to the national average of 53 percent (Davis, Smith and Marsden, 2007). In terms of income, rural populations have seen a decline in poverty, and rural poverty rates remain higher than urban rates (Economic Research Service, 2004).

Rural health and health care perspectives are informed not only by population characteristics but also by community characteristics. A recent Carsey Institute report (Hamilton, et.al, 2008) describes four different types of rural communities (see text box). Understanding 'within rural' variation by population and community characteristics is important in order to design public programs and policies that target unique rural characteristics, particularly those associated with underserved and/or impoverished communities. These variations in community health, race and other sociodemographic

characteristics underscore that a one-size-fits all policy approach to health care delivery and health workforce education is insufficient. Public policies and programs need to include features that are sensitive to important rural population and community contexts. Historically, a blunt approach has been used to address many health care challenges. For example, numerous public policies and programs were developed based on urban characteristics with expectations that they could be applied on a smaller scale to rural areas (e.g., the prospective payment system). Needed instead are public policies and programs that, where appropriate, consider population and related health care opportunities and challenges found across rural regions.

To the extent that health and demographic characteristics are different between rural and urban populations, health professions training needs to reflect these differences. This alignment between health professions training and population and community characteristics is prerequisite to achieving improved rural population health and high performing rural health care.

Categories of Rural Areas

Amenity-rich: Rural areas experiencing a rise in property values and increased services as baby boomers move here to retire; affluent professionals settle and commute to work or purchase second houses in these small towns. Rural towns in the Rocky Mountains in Colorado are an example of this type of rural area. These areas have an increase in population with a large percentage employed and few experiencing poverty.

Declining-resource-dependent: Rural areas experiencing population decline and historically dependent on industries such as mining and agriculture. As resources are depleted and globalization occurs, low skill, low pay jobs remain. Midwestern towns in Kansas are examples of this type of rural areas. These areas are experiencing population decline with out-migration of younger adults and declining house values.

Chronic poverty: These areas are marked by long-term shortages in resources, infrastructure and education and offer little to attract new residents. Examples of this type of rural are the Appalachia area in Kentucky, the Mississippi Delta and the “Black belt” of Alabama. These areas are marked by population decline especially in young adults, few residents employed, low house values and a larger percentage living in poverty.

Amenity/decline: These areas are starting to experience a decline in their economy and out-migration of young adults. These areas are located in the Northwest and Northeast which have traditionally relied on resource based industries such as the pulp and paper industry as the basis for their economy. With globalization, there has been a weakening of these industries. (Hamilton, et.al, 2008).

Rural Health Care Delivery System Characteristics

Rural and urban health care infrastructure share much in common; however, there are also significant differences that have implications for the rural health care workforce. While rural health care services typically include primary, acute and long term care, the structure and reimbursement of these services have somewhat unique features. For example, in rural areas primary care is often delivered through federally designated rural health clinics (where payment is linked to a cost-based reimbursement formula and midlevel providers such as nurse practitioners have been required as part of the federally defined care team). Similar to urban areas, federally qualified community health centers are scattered across rural regions of the Nation. Different from urban areas, acute care is commonly provided by either prospectively paid hospitals (PPS) or critical access hospitals (CAH). Critical Access Hospitals, constituting 23 percent of all short-term general hospitals in the Nation, receive cost-based reimbursement, must be limited to 25 or fewer beds, and often have more of their revenue generated by non-acute (e.g., long-term care, ambulatory care) than by acute care services. Within rural hospitals (both PPS and CAH), designated swing beds are frequently used to allow these hospitals to convert beds to either acute or long-term care, depending on patient need.

Differences can also be found in the structure and deployment of services offered by rural health care facilities. For example, rural hospital emergency rooms often have on-site staffing by either physicians or by physician assistants or nurse practitioners, the latter with access to off-site physicians as needed. Also, many rural areas rely heavily on volunteers to provide ambulance services for their communities in contrast to urban areas that have fully staffed and paid emergency medical services personnel. Regarding public health, services provided in small rural jurisdictions are far less likely to provide primary care services compared to public health agencies within very large urban areas (National Association of County and City Health Officials, 2006).

Across rural health settings, low volumes of patient encounters are common and drive resource sharing (both shared personnel and shared services) across health care settings and communities. Shared resources can range from mobile MRI units, to quality improvement staff, to mental health providers. Shortages of some providers in rural areas drive expanded utilization of others. For example, as noted earlier, physician assistant and nurse practitioner practices often include staffing emergency rooms with physicians off-site but available as needed (NACRHHS, 2008). Pharmacy technicians and physical therapy technicians extend the reach of pharmacists and physical therapists to smaller communities with populations too small to support full-time providers.

In other respects too, rural health care infrastructure and population characteristics pose different expectations for the workforce. As a result, rural health professionals require skill sets and breadth of knowledge different from their urban counterparts. For example, while the service mix in rural facilities tends to be less complex, seriously ill individuals, particularly the elderly, occasionally choose to be cared for locally. Also, serious work-related and traffic accident victims present in rural emergency rooms for complex trauma care. While many rural hospitals have some intensive care services, many do not. Additionally, rural hospitals tend to be 'health care central' often with co-located services as opposed to available freestanding ambulance service, home health services, or even long-term care. It is not uncommon to see health care clinicians provide care across these co-located settings.

Nationally, shifts away from institutional care to home- and community-based care are occurring (IOM, 2008). However, home- and community-based care are particularly difficult to operationalize in small rural communities with minimal availability of direct care workers, home health providers and other necessary staff. Reconfiguring the delivery of these services to include the use of technology, educating patients and families to assist with self-care activities, and deploying non-health care community members, are examples of approaches that could be used to help manage care needs of a subgroup of rural elders in home- and community-based environments.

Organizational networks. Organizational networks and partnerships frequently found across rural health care settings are often driven by resource scarcity. Cooperation that predisposes toward partnerships and networks is fostered by rural community culture that encourages a sense of mutual accountability across health providers and patients (McCarthy, Nuzum, Mika, Wrenn, and Wakefield, 2008). It is common to find established linkages across providers and facilities that facilitate shared personnel, equipment and knowledge as well as information and communications technology connecting members of virtual health care teams across geographic distances in the delivery of patient care.

The rationale for using technology to outreach services in rural areas is particularly compelling given the shortages of providers and the inefficiencies associated with delivering care in low volume environments. For example, virtual networks that deliver telemedicine and telepharmacy promote system integration, extend the rural workforce and enhance communication. One example of an effective model in North Dakota extends the reach of pharmacy services using pharmacists, pharmacy technicians and health information technology. Through this network, pharmacy services are provided to communities that would otherwise not have them and it does so while maintaining quality outcomes, as evidenced by medication error rates below the national average (McCarthy et al, 2008). This model involves: 1) a Federal matching grant to the North Dakota State University College of Pharmacy; 2) State regulatory changes; 3) academic training and research; as well as 4) clinician and health care organization changes.

Cooperation and partnerships across providers, health care settings and communities is encouraged in part as a result of Federal programs that require partnerships (e.g., rural health outreach grants awarded by the Federal Office of Rural Health Policy). Efforts to strengthen linkages across health care sectors (e.g., hospital to hospital or hospital to home health agency) are beginning to extend to also include population health (e.g., hospital to community sectors such as law enforcement and schools and/or hospitals and public health). Given rural population characteristics described earlier, creating networks that link acute care with population health infrastructure are, while complicated, especially important.

Strengths found in rural areas, such as networks across communities and facilities, can facilitate the development of care models with implications for new approaches to quality, including state-of-the-art care pathways, approaches to quality measurement and other quality improvement efforts. Health care models such as Accountable Care Organizations and Medical Homes can leverage features common to rural health care delivery settings, including cooperation, coordination and networks. However, it is important to keep in mind that the reorganization of rural health care delivery will place new demands on the rural health workforce. These new care models require particular attention to how to effectively implement them in rural environments given differences in infrastructure, staffing, financial resources and other key characteristics. With new models, quality improvement efforts will need to be fashioned within organizational environments that may be

different from urban organizations. For example, in some rural areas, quality improvement initiatives are organized across networks that knit geographically dispersed health care facilities together. In other words, rather than working within organizations to improve health care quality, many rural efforts are underway to work across organizations to improve care quality. Learning how to leverage quality improvement network functions is an important part of the quality improvement competency needed in rural workforce education. It is also another illustration of the need for academic content that is rural relevant. Given the orientation toward networking and organizational partnerships, rural areas should provide a different orientation to developing and testing strategies to create organizational cultures that support learning organizations; a key dimension of quality improvement. These important features of health care delivery in rural areas have accompanying implications for the educational preparation of the rural health workforce.

Improving rural health and health care quality. New quality improvement efforts that are undertaken within emerging rural health care models face significant challenges. For example, many rural facilities have no computer-based electronic medical record or prescription order entry systems. Without information technology, collecting and analyzing data for quality improvement purposes is significantly time-intensive. Another serious challenge relates to the low volume of health care services. Given low patient volume, rural health care providers face related measurement and data reporting challenges. Having too few cases (e.g., in-patient care of myocardial infarct patients) from which to collect data jeopardizes the accuracy of that data and even the implementation of related public reporting efforts tied to payment.

Moreover, rural health systems have personnel, processes and structures that require special consideration when selecting quality measures. Quality measures, particularly those tied to payment, need to be evaluated for appropriateness to rural health care settings and populations. While many quality measures capture the types of care common in both rural and urban facilities (e.g., Hospital Compare measures related to community acquired pneumonia), some quality measure are far less relevant to rural care (e.g., acute myocardial infarct inpatient measures).

As with quality measure development, research that focuses on facets of health care quality should be sensitive to both similarities and differences between rural and urban health care settings. A body of research is beginning to show care quality strengths and limitations of rural health care systems. For example, both Critical Access Hospitals (CAH) and non-CAH rural hospitals have shown significant positive increases in the percent of patients receiving recommended care for the majority of Hospital Compare quality measures. CAHs also demonstrate important quality improvement, particularly with regard to delivering recommended care for acute myocardial infarction and congestive heart failure patients (Casey, et al, 2007). Related to performance differences between rural and urban facilities, some research indicates that certain conditions are treated more effectively in rural facilities (e.g., community acquired pneumonia) while others are treated more effectively in urban facilities (acute myocardial infarction).

While important rural health research has been conducted, the quality agenda for rural health care will continue to require significant investment in research, expertise and infrastructure. More needs to be learned about the current state of rural health care quality and effective strategies around measuring and improving care. Meanwhile, quality improvement targeting rural population health is also being discussed. “Rural communities must re-orient their quality improvement strategies from an exclusively patient or provider-centered approach to one that also addresses the problems and needs of rural communities and populations,” (IOM Quality through Collaboration, 2005).

Furthermore, the Commonwealth Fund (Shih, Davis, Schoenbaum, Gauthier, Nuzum, and McCarthy, 2008), notes that more needs to be learned about how health care systems can interact optimally with public health systems, as well as with communities at large, in order to positively impact population health. This reorientation has implications for rural health research, practice and workforce education, including the development of community level registries, health promotion and illness prevention initiatives, and the deployment of community- and clinically-based health teams. The expertise required of the health care workforce includes the science of quality improvement and the ability to apply that science both within health care systems and eventually, across population health.

Rural Health Care Workforce Characteristics. Deploying health professionals to serve small, geographically dispersed communities has been a chronic challenge for many rural areas across the Nation. Recruiting health care providers to areas with a declining population base is especially difficult (McCarthy et al, 2008). More health professional shortage areas are designated in non-metropolitan than in metropolitan areas. Generally speaking, rural areas have fewer specialty providers and are more reliant on primary care resources including physician assistants and nurse practitioners (Henry and Hooker, 2007). Thin staffing levels even influence access to continuing education because of the resulting burden often created when even one health care provider spends time away from a rural community pursuing further education.

Rural citizens also have less access to public health services than their urban counterparts. In fact, it is not uncommon to find rural communities without a local public health agency. Where rural public health agencies do exist, staff often have limited public health training. While public health training tailored to rural community needs has been called for, rural community characteristics (including small tax bases and low incomes) are often insufficient to support public health services (Meit, 2006).

Geographic isolation, resource shortages and desire to preserve local economies to ensure community viability foster rural creativity in the pursuit of new health care workforce approaches (McCarthy et al, 2008). However, creating learning environments, applying quality improvement content and skill, and participating in sophisticated interdisciplinary collaboration in the context of rural health care systems is a complex undertaking. Nevertheless, these interrelated capacities are essential to the delivery of quality care to rural populations.

To achieve high performance rural health care, rural health workforce performance is as important as rural health system performance. A high performing rural health system that meets the diverse needs of rural populations is predicated on a rural workforce fully trained in core workforce competencies. These competencies reflect training in new models of team-based practice, including care coordination and quality improvement.

Care Coordination. In light of the organizational structures found in rural health care, an emerging priority area in rural health care delivery is care coordination and the management of care transitions across health care team members and care settings. Care coordination, a product of sophisticated teams and processes, is defined as:

The deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of

health care services. Organizing care involves the marshalling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care (McDonald, Sundaram, Bravata, Lewis, Lin, Kraft, McKinnon, Paguntalan, and Owens, 2007, p. 41).

Without meaningful care coordination, medical errors are more frequent, unnecessary care increases, and patients and their families are likely to be dissatisfied. Evidence indicates that care coordination can improve health outcomes and reduce costs, particularly for patients with complex care needs (Shih, et. al., 2008). Care coordination helps to ensure that the right health care services are delivered in the right order, at the right time and in the right setting. Meeting this expectation is particularly challenging when care spans physical distance, traditional role boundaries, continuity of services across various sites, and transitions over time (McDonald, et.al., 2007). These challenges (described in the previous section on Rural Health Care Delivery System Characteristics) to care coordination are common to rural health care.

Interdisciplinary Teams. Interdisciplinary teams reflect a partnership among professions based on: 1) a shared mission; 2) a shared bio-psychosocial paradigm; and 3) a shared responsibility for decision-making and problem solving. Leadership is based on the expertise needed to improve health outcomes in a shared relationship with individuals, families and communities” (Laskin, Augsberger, Hawkins, Olson, Rice, Soloway, and Ball, 2001). Embedded in interdisciplinary team care is care coordination. Sophisticated interdisciplinary team work requires the knowledge and skills necessary to be able to effectively cooperate, communicate, collaborate and integrate care to ensure that care is coordinated and reliable (IOM, 2003). Configuring and deploying teams in rural areas often involves implementing care coordination under different circumstances and using different approaches than those engaged in urban settings. For example, while team members in urban health settings are often located in physical proximity to one another, care requirements and health infrastructure in rural areas drive different team configurations. Since rural health systems often deliver less specialized care than urban facilities, seamless transfers and referrals of patients to providers at great geographic distance are expected. Seeking consultations when patients require complex emergency care can also necessitate coordination with clinicians that rural providers rarely if ever meet. In some locations, patient-clinician interaction occurs via audio/video technology. These circumstances require ‘virtual team approaches’ that incorporate knowledge and skill in care integration across geographic distances and across team members.

In the absence of team approaches, fragmented and inefficient care can occur. For example, individual health care providers, based in different health care settings with access to different resources, may pursue different interventions that lead to potential misunderstandings and duplication of services (e.g., repeating lab tests at a tertiary facility upon arrival of a transfer patient, harsh criticism of the quality of care rendered at a distant facility). At times, a challenge for team training in rural practice sites is the lack of the following: local expertise in rural-relevant models of care coordination, evidence underlying features of rural team practice and knowledge regarding quality improvement science. Establishing a strong quality improvement orientation requires clinicians with knowledge of the science of quality and safety improvement, related processes in place and access to resources. This includes knowledge of or access to safety design principles, testing interventions to improve care processes, human factors analysis, and the use of practice guidelines for example. Ultimately, enhancing rural workforce capacity includes both the education, training and deployment of health care professionals with requisite competencies as well as the

preparation of rural residents to function as members of the health care team with the ability to substantially contribute to improving their own health.

For example, when student competency in interdisciplinary care knowledge and skill is expected in academic environments but not practiced in clinical environments, the value of this knowledge is undermined and the ability of new health care providers to apply these functions, regardless of their discipline, is markedly inhibited. Limited quality improvement infrastructure in many rural health settings can challenge reengineering from silos of care to interdisciplinary team care. Additionally, this set of knowledge and skills is not consistently incorporated in health professions education programs. Both health workforce education redesign and health care system redesign should move forward in tandem to avoid disconnected expectations, fragmented approaches, and compromised ability to provide high quality care.

Improving Rural Health Care Quality through Competency Development: Interdisciplinary Team Practice and Quality Improvement

Since 1999, the Institute of Medicine (IOM) has released 12 reports focusing on aspects of health care quality. The high profile reports, often referred to as the ‘Quality Series’, identify significant shortcomings in the quality of American health care. To address the identified challenges and achieve consistent, high-quality care, the Quality Series provides sets of recommendations. Over the almost ten years since the first report was published, “...broad-based efforts have begun to bring more sophistication and precision to measuring and improving the safety and quality of health care” (Wakefield, 2008, p I-47). While there is substantial work left to be done in the health care delivery arena to improve care quality, parallel efforts in health workforce education programs are also needed.

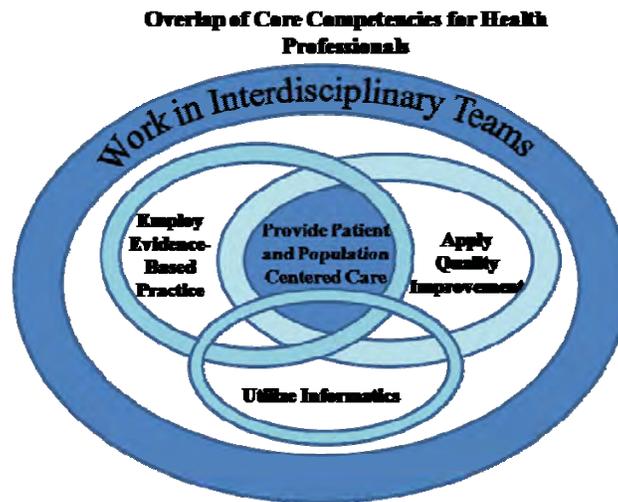
The IOM Quality Series has a plethora of relevant implications for the rural health workforce. Beginning with the reports “To Err is Human” and “Crossing the Quality Chasm, the IOM cast a vision for a reformed health care system, including the health care workforce. To implement the IOM’s report recommendations, academic environments and health care systems need to be redesigned. This redesign is essential for teams to meaningfully contribute to achieving the six aims for health care improvement (safe, effective, efficient, personalized, timely, and equitable) and the associated building of high performing health care systems (Galvin and Wakefield, 2002).

Concerned about the readiness of health professions education to field graduates capable of delivering consistent high quality care, the Health Professions Education report bluntly states that “education for the health professions is in need of a major overhaul” (IOM, 2003, p.1). The report noted five competencies essential for all health care providers (see figure below). These competencies include:

1. Provide patient-centered care: identify, respect, and care about patients’ differences, values, preferences, and expressed needs; relieve pain and suffering; coordinate continuous care; listen to, and continuously advocate disease prevention, wellness, and promotion of healthy lifestyles, including a focus on population health.
2. Work in interdisciplinary teams: cooperate, collaborate, communicate, and integrate care in teams to ensure that care is continuous and reliable.
3. Employ evidence-based practice: integrate best research with clinical expertise and patient values for optimum care, and participate in learning and research activities to the extent feasible.
4. Apply quality improvement: identify errors and hazards to care; understand and

implement basic safety design principles, such as standardization and simplification; continually understand and measure quality of care in terms of structure, process, and outcomes in relation to patient and community needs; design and test interventions to change processes and systems of care, with the objective of improving quality.

5. **Utilize informatics:** communicate, manage knowledge, mitigate error, and support decision making using information technology (IOM, 2003 p. 45-46).



**Relationship among core competencies for health professionals (modified to include populations)
Source: IOM Report "Health Professions Education: A Bridge to Quality (2003)**

The Quality Through Collaboration report called for a renewed effort to enhance the health professions workforce in rural areas, underscored the need for rural-relevant preparation in quality improvement knowledge, and recommended that the five competencies listed above be embedded in Federal training programs that focus on rural health care (IOM, 2005).

Since the release of these reports, the science of quality improvement has expanded markedly. This makes a number of the report recommendations even more relevant than previously thought. During the intervening years, substantial quality improvement, care coordination, and interdisciplinary team content and related evidence has been produced. This new knowledge can help ensure that clinicians practicing in rural areas have even better information to review and adapt in order to improve the structure of their care processes and systems.

How the interdisciplinary team and quality improvement competencies are applied to achieve the six aims for improvement may be somewhat unique in rural health care settings. For example, as personnel shortages continue in rural areas, clinicians will need enhanced knowledge and skills in order to evaluate and design work environments (including HIT applications) and clinical functions in ways that can help improve quality and efficiency and mitigate the impact of fewer health care providers. Interdisciplinary teams can help to reduce redundant services and facilitate development of more creative solutions to complex problems because of team members' diverse academic backgrounds (IOM, 2003).

The table below provides some examples of how the application of the interdisciplinary team care competency can contribute to achieving the six aims for improvement in rural health care settings.

I. Factors that Influence Rural Health Quality	
Health Care Workforce	Health Care Systems
Education and practice that incorporates interdisciplinary team care	Organized care processes and structures that accommodate interdisciplinary care
II. Examples that Illustrate how Interdisciplinary Teams can contribute to Achieving the Six Aims for Improvement in Rural Health Care Systems	
Aims	Interdisciplinary teams in rural health care systems
Safe	Front line providers use HIT to link to additional personnel/expertise (e.g., pharmacists/pharmacy techs, e-ICUs), creating virtual teams.
Effective	With limited quality improvement infrastructure/personnel, all team members are responsible for identifying, adapting, and adopting rural relevant safe practices (e.g., evidence-based processes that support patient transfers). QIO and Flex program expertise are accessed as well.
Patient-Centered	Patient and families are known to the health care team. This shared knowledge contributes to caring for and engaging patients in their own care.
Timely	Networks are leveraged to seamlessly link care processes and avoid waste of time/resources (e.g., patient diagnosed with MI in rural hospital, transferred via ambulance and admitted directly to cardiac cath lab in tertiary hospital).
Efficiency	Human resources are deployed efficiently. In the context of team practice, clinicians engage their full scope of practice (e.g., mental health providers, PAs, NPs, deliver primary care/acute care). Rural hospitals are a 1-stop shop for most care and providers are skilled at moving across settings (e.g. ER, acute care).
Equitable	Health care services are available to all, regardless of geographic location.

In addition to providing examples of ways that interdisciplinary teams can contribute to care quality in rural health care settings, research examples can also illuminate the value of interdisciplinary team care. Findings to date, point to improved survival and quality of life, quality of care, and patient satisfaction. Some studies have also found lower total costs, fewer hospital admissions and emergency department visits, as well as fewer physician visits (IOM, 2008.)

Additionally, research indicates that teams have been shown to improve select patient outcomes in stroke, heart failure, and other conditions (Walsh, et al, 2005). And yet, today, with relatively few exceptions, “There is a profound disconnect between current role-oriented, isolated academic preparation and practice environments that rely on teams” (IOM, 2003, p.79).

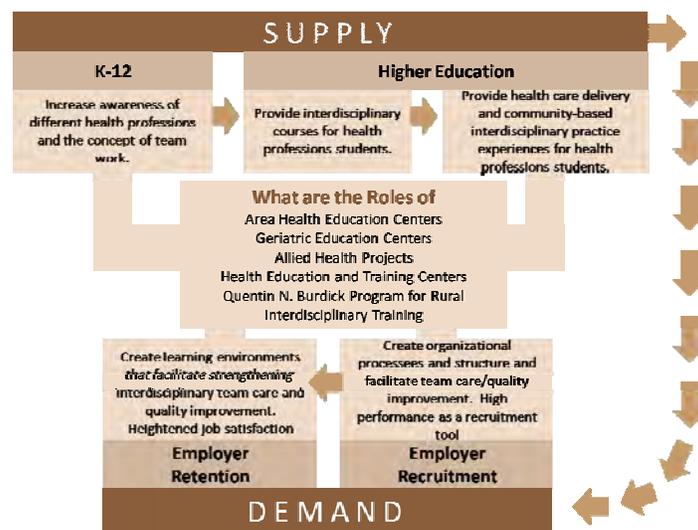
A key to fostering interdisciplinary practice is interdisciplinary education. Improved understanding of the characteristics of teams and training that produce high performance team interactions would be an important contribution to standardizing successful rural team dimensions.

Implications for Federal Programs

There are two clear directions that can be pursued by the Division of Diversity and Interdisciplinary Education and its parent organization, the Bureau of Health Professions (BHP_r). First, through its own programs, BHP_r can work to strengthen interdisciplinary activity and quality improvement across the rural workforce pipeline. Secondly, BHP_r can work with other Federal agencies and national organizations to create a combined focus on both rural health professions training and practice. Engaging a health care quality agenda by linking these two areas together ensures that advances made in either area influence and inform the other. Brief examples of each of the two directions are provided below.

Example I. Educational programs supported by the Bureau of Health Professions could further strengthen the adaptation of interdisciplinary team approaches to rural health care. BHP_r programs that touch various points along the workforce pipeline could facilitate interdisciplinary team exposure and training. The graph and narrative below provide examples of team orientation, training and practice that could be encouraged across the workforce pipeline.

Interdisciplinary Training Across the Rural Workforce Pipeline



K-12. Increase awareness of different health professions and the concept of team work.

While the AHEC program provides health care awareness programs to K-12 students, these and other BHP_r programs can be extended to include content on interdisciplinary team work in order to raise awareness of the many facets of working within the context of a rural health care team. For example, as content describing the different health professions are covered, instruction could incorporate material on how the professions are linked together and work as a team.

Higher Education. Provide interdisciplinary courses for health professions students.

Education on rural interdisciplinary team work can be encouraged to begin before students enter formal health professions programs. The University of South Hampton, United Kingdom developed an integrated common learning program where students receive instruction on collaborative

learning, inter-professional team work, and the application of these principles to practice as pre-health students.

Higher Education. Provide health care delivery and community-based interdisciplinary practice experience for health professions students.

The Quentin N. Burdick program for Rural Interdisciplinary Training provides interdisciplinary training to health professions students. The University of Minnesota AHEC has developed 14 communities with community-based projects that engage students from a variety of disciplines including among others are pharmacy and dietetics,. East Tennessee State has community-based interdisciplinary coursework (including public health students) targeting rural communities. Prompted by the IOM ‘Quality Series’, University of North Dakota students from various health disciplines participate in a six-week interdisciplinary course using interdisciplinary teams to learn about patient cases using a patient centered learning model.

Higher Education. Create organizational processes and structures, and facilitate team care/quality improvement. High performance as a recruitment tool.

Initiatives such as TeamSTEPPS, taught in both clinical settings and academic programs, provides common language for current and newly employed health care providers to more effectively work together. Rural health care systems with a commitment and reputation for delivering high quality care can be a recruitment tool for health care clinicians.

Employee Recruitment. Create learning environments that facilitate strengthening interdisciplinary team care and quality improvement. Heightened job satisfaction.

Receptivity, knowledge, and skill are precursors to working as a member of an interdisciplinary team. Rural practice environments must reflect an organizational culture that expects current and new health care providers to competently engage in interdisciplinary teams and encourage all providers to contribute to quality improvement efforts. Professionals who operate in a learning environment free of blame and conducive to improvement can enhance retention of health care providers through heightened job satisfaction.

An example of the second direction that can be pursued is illustrated below. The narrative describes federally sponsored programs and products that, once linked, strengthen the impact of Federal programs at the local level by facilitating improvement in care quality.

The redesign of both health professions education and health care systems to improve care quality rely on similar knowledge, expertise, and research efforts. Consequently, Federal programs that focus on workforce education, service delivery, research on quality, and payment policy should be working in tandem (e.g., BHP, AHRQ, ORHP, CMS). Linking efforts across local academic and service delivery settings by leveraging products and services available through Federal agencies can help to ensure that services and education are mutually informed and aligned. Adopting this orientation makes the work of organizations such as the National Quality Forum (NQF) highly relevant to the Bureau of Health Professions. For example, given NQF’s increasing attention to clinician level performance measures, the related performance expectations of clinicians are highly relevant to educational preparation of health professionals. Ultimately, linking efforts across Federal and other high profile programs that focus on aspects of quality, ranging from education to care delivery to payment policy, can enhance the likelihood that health care facilities will successfully meet quality targets, receive commensurate payment for performance, and most importantly, that patients will receive high quality care. Closely aligning rural workforce training in quality improvement and interdisciplinary team care with the redesign of rural practice settings to improve

care quality could benefit both academic and health care delivery efforts (see example below). Encouraging Federal programs to share their focus on quality, while also encouraging local applications of that shared focus, can be built into BHP training programs and recommended by BHP to other Federal agencies.

Leveraging Federally funded Health Professions Education and Health Care Programs to Improve Rural Health Care Quality: FLEX, TeamSTEPPS and AHEC

The Medicare Rural Hospital Flexibility Program (FLEX), in addition to supporting the development and networking of Critical Access Hospitals (CAHs), has recently begun working on quality improvement initiatives including quality reporting and benchmarking. This program allows individual States to tailor initiatives to their needs. The FLEX program in North Dakota is working with North Dakota CAHs to provide training in Team Strategies and Tools to Enhance Performance and Patient Safety (Team STEPPS). TeamSTEPPS is a program developed by the Department of Defense and the Agency for Healthcare Research and Quality (AHRQ) and uses an evidence-based framework designed to optimize interdisciplinary team performance across various sectors of the delivery system. TeamSTEPPS includes specific approaches to quality improvement (e.g., sharing error reduction strategies).

TeamSTEPPS incorporates the patient and caregivers in the team construct. Given the familiarity of health care personnel with most individuals in their rural communities, how this construct is executed may be different and have differential results than in environments where the relationship between health care providers and patients and their families is one based only on professional rather than personal and professional dimensions. TeamSTEPPS is based on previous studies which have examined the impact of teamwork on patient safety.

The University of Nebraska Medical Center originated the program and provided Team STEPPS training to 25 CAHs in Nebraska (Jones and Skinner, 2008). These CAHs used the results from the Hospital Survey on Patient Safety Culture (AHRQ) to determine which tools to implement in their facilities.

The University of North Dakota is implementing a new AHEC which will link to a set of North Dakota CAHs that have been trained in TeamSTEPPS. This will facilitate interdisciplinary AHEC student experiences in facilities that are implementing the TeamSTEPPS framework with the intent of mutually reinforcing both the students' and the clinicians' acquisition of this knowledge and skill set.

Conclusions

The following conclusions are drawn from information and ideas presented in this paper. These conclusions are stated so they reflect specific implications for public policies and programs.

1. Federal agencies that include a focus on rural health care quality should use their respective programs and products to require links between rural education and care delivery settings (e.g., FLEX, TeamSTEPPS, AHECs, and Quality Improvement Organizations).
2. Relationships should be developed among advisory boards of HHS programs that have a focus on health care quality (e.g., ORHP, CDC, AHRQ, MedPAC, CMS) in order to share rural models, research findings, and program derived lessons.
3. Federal demonstrations and/or grant programs could give preferential funding for projects that target rural care coordination, interdisciplinary team approaches, and quality improvement knowledge acquisition and application.

4. BHPPr programs could frame their workforce education programs so that their contribution to achieving high performing rural health systems is recognized.
5. BHPPr programs that include a focus on rural workforce education could be enhanced by prioritizing mastery of the IOM core competencies identified as essential to providing high quality care. Opportunities exist and/or could be created across BHPPr programs, as well as across the workforce pipeline, to address these competencies. Steps can be taken to strengthen current program expectations (i.e., AHECs focus on both provider supply as well as quality of the health care workforce) and create new expectations for BHPPr programs that prioritize interdisciplinary education and care delivery in rural settings.
6. While quality related efforts of CMS focus largely on payment for performance and public reporting, achieving these goals is also contingent on the preparation of a workforce capable of delivering high quality rural health care. The Bureau of Health Professions and CMS should inform each other's work in this shared area.
7. BHPPr quality improvement and interdisciplinary workforce efforts (e.g., grant funded models) should be broadly disseminated to key rural audiences through organizations such as the National Rural Health Association and the National Organization of State Offices of Rural Health. National and regional conferences, and other communication vehicles that target these audiences, are important means of communicating key contributions of workforce competencies to high performing rural health systems and patient outcomes.
8. More support is needed to develop and disseminate successful academic models that teach and test performance attributes essential to delivering high quality care within rural health care settings.
9. The Division of Diversity and Interdisciplinary Education could disseminate publicly available tools designed to improve care quality and foster interdisciplinary teams (e.g., the AHRQ and DOD produced TeamSTEPPS). This content can be adapted for pre-professional education as well as continuing education environments. Efforts to encourage uptake of these tools, with an eye toward needed adaptations for rural practice, should be encouraged through relevant BHPPr programs.
10. Research could be supported that would help to identify effective means for configuring and deploying health care teams using technology-based interventions and focusing on teams comprised of members at great geographic distance from one another.
11. Policies and grant programs could be strengthened (where they already exist) and/or be designed to support initiatives that further delineate the relationship between rural health professions educational content and clinical experience, and the quality of health care delivered to rural populations.
12. BHPPr efforts could explore how health and health care of rural populations can be threaded across the workforce pipeline, including determining how current and future health professionals can effectively learn and apply the IOM core competencies of interdisciplinary team care and quality improvement in the context of rural health care and rural population needs.

Recommendations

This section presents a set of contemporary recommendations that use as a base some of the recommendations from two IOM reports: “Health Professions Education: a Bridge to Quality” and “Quality Through Collaboration: the Future of Rural Health”. These recommendations are also informed by content presented in this paper.

1. HHS could fund comprehensive rural system reform demonstrations that target better integration of personal and population health services with the goal of meeting the six aims for improvement across both environments (that is, within formal rural health care delivery systems and across rural population health efforts).
2. HHS should convene a rural interagency task force to consider strategies to strengthen the quality improvement continuum, beginning with educating the health care workforce to measuring and improving rural health care in the United States. Meeting participants should develop an agenda focused on quality that bridges rural workforce education, health care delivery, research, and payment policy. These meetings should also serve to share information about and leverage knowledge, policies and programs targeting health care quality.
3. Joint demonstration projects should be funded by AHRQ, CMS, BHP, and ORHP to explore interdisciplinary education and practice approaches with the goal of providing and evaluating rural clinical training experiences that incorporate the five core competencies of the IOM Health Professions report, with particular attention to interdisciplinary team and quality improvement competencies.
4. AHRQ, BHP, and other relevant HHS agencies should support research initiatives that explore the two prioritized core competencies and their relationship to both individual and rural population health.
5. In the five years since the Health Professions report was developed, additional science and clarity of the contribution of team efforts and quality improvement knowledge has increased. However, there is a lack of readily available information about academic efforts that embed interdisciplinary training and quality improvement into health workforce training, including the rural workforce. HHS should support vehicles for identifying and disseminating this information in order to encourage rapid spread across academic programs.
6. Where it does not currently exist, program initiatives should encourage involving two or more disciplines in submitted grant proposals – and should encourage co-Principal Investigators from multiple disciplines to work together.
7. A biennial interdisciplinary summit should be held that involves health care leaders in education, practice, payment policy, oversight processes, and other key stakeholders. The summit should develop explicit targets and goals related to prioritized core competencies and their incorporation in both education and rural practice environments in order to ensure adequate preparation of the next generation of rural health care providers.

8. BHPPr should consider funding one or more centers that leverage existing quality improvement information, including rural practice innovations and state-of-the-art rural educational efforts, and disseminate actionable information (i.e., curriculum ready) and provide related technical assistance to academic programs across disciplines. This could also include developing a centralized website which could be used to disseminate best practices and tools to assist rural communities as they work to adapt interdisciplinary approaches. One model for this effort is the FLEX program which has created a technical assistance and services center that provides all of the FLEX programs across the country with a wide array of useful information including tools, contact information for organizations, and relevant quality indicators.

In summary, improving the health of rural populations is predicated on a number of achievements including: 1) a high performance rural health care workforce; 2) redesigned education that aligns with redesigned health care; 3) strengthened academic program expectations around competencies essential to practice in a 21st century rural health system; 4) standardized performance measures for core competencies across health professions education programs; 5) alignment across relevant Federal agencies to develop a shared orientation; and 6) anticipating and preparing for future needs of rural populations through both health workforce and health care delivery efforts. While the Federal government is only one stakeholder seeking to improve rural population health, it is a major stakeholder and each of the achievements listed above can be influenced by Federal policy.

The commitment of the Bureau of Health Professions to improving the health of rural populations is captured in its mission statement. This paper has presented an analysis of environmental factors that can influence the Bureau's ability to improve the health status of rural populations and specific strategies that BHPPr can use in the pursuit of their mission statement have been delineated. Specifically, interdisciplinary team approaches to care, and the related focus on quality improvement, have been described in ways that are particularly relevant to the work of the Division of Diversity and Interdisciplinary Education.

Footnotes

1. While they are referenced, this paper does not summarize all quality improvement and interdisciplinary content from the IOM reports "Health Professions Education: a Bridge to Quality" or "Quality through Collaboration: the Future of Rural Health".
2. Programs within a particular Federal agency (e.g., the Bureau of Health Professions) could employ different rural definitions, depending on the characteristics and intent of the program. This tailored approach however needs to be balanced against the confusion that can emerge for grantees applying for support from similarly focused programs and also balanced against the effort needed by the agency to carefully craft guidance that reflects the use of different definitions across different programs.

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CHAPTER 2: CONCEPT PAPER

RURAL HEALTH WORKFORCE STATUS AND ISSUES BY GARY HART, Ph.D.

TABLE OF CONTENTS

Purpose / Overview.....	37
Demographics of Rural Populations	38
Physicians	40
Registered Nurses.....	43
Physicians Assistants and Nurse Practitioners.....	44
Oral Health Providers.....	45
Pharmacists	46
Other Health Professionals.....	47
Issues and Trends.....	47
Recommendations.....	49
Closing Comments.....	50
Figures	51
References	61

One of the most recalcitrant problems of the rural health landscape is the uneven distribution and relative shortage of health care providers. Despite considerable efforts by Federal and State governments over the past three decades to ameliorate these problems, rural provider distribution and shortage issues have persisted and sometimes intensified (Hart, et al., 2002). The National Health Service Corps, Community Health Centers, Rural Health Center, Medicare Incentive Payment, Title VII and VIII funding of medical and nursing education, Critical Access Hospital, Conrad-30, and many other programs are aimed, at least in part, at addressing provider shortages in rural communities. Nevertheless, the rural U.S. population has been plagued with health care provider shortages and maldistributions for over a century.

The purpose of this paper is to provide a brief overview of rural health workforce issues and provider types. Because there are hundreds of provider types and specialties, depending on how one counts, of necessity this paper is selective and often cursory. Selected issues and provider types/specialties are described and discussed dependent on the author's knowledge, priorities, and the availability of good information. Many important provider types and issues are not included. While the topic of health workforce at first glance can seem simple and straight forward, it can be extremely complex and multifaceted. It is not possible in this paper to provide a description of the basic foundations of health workforce analysis and conceptualization. Instead the bulleted list below briefly provides some essentials.

- Training and practice: The two major facets of health workforce involve the training of professionals (e.g., by specialty and gender) and their subsequent practice (e.g., location and retirement age).
- Head counts versus full-time equivalents: There is a vast difference between counting the number of a provider type and discounting this number by a measure of work produced (e.g., hours of direct patient care or face-to-face care encounters).
- Complements versus substitutes, including scope of practice: Provider types and specialties within provider type can complement or substitute for each other. For instance, there is little overlap between a cardiologist and a dermatologist; a dentist and dental hygienist complement one another; and a generalist nurse practitioner (NP) and a family physician (FP) overlap on a significant portion of their clinical scope of practice (i.e., substitutes for many types of care). Scope of practice is the term used to describe the extent of clinical practice performed by a provider type or specialty (e.g., the different diseases that are treated and the procedures that are commonly performed).
- Geographic definitions: The Office of Management and Budget (OMB) metropolitan, micropolitan, non metro definition, Census Bureau Urbanized Area, and the Rural-Urban Commuting Areas are typically used to describe rural/urban (Hart, Larson, & Lishner, 2005).
- Provider career migration: Thinking of physicians and other providers going through training and then locating in a single practice for the rest of their careers is not typical (Ricketts & Randolph, 2008).
- Geographic scale, including over and under bounding: Analyses of workforce data are performed with different types of geographic units (e.g., nations, counties, and ZIP code areas). Results can vary with the same underlying distribution – a severe shortage can be masked by a geographic unit that is too large for the phenomena being investigated (over bounding) and vice versa if the unit is too small.
- Shortages versus maldistribution: Workforce shortages often occur in geographic units (e.g., state or nation) that also have greater than expected workforce supply. Shortages can denote many things but usually mean that there are not enough providers to care for those who

need care, or those who through some means can pay for it. Keep in mind that maldistribution and shortages exist for reasons and are not easily remedied.

- Supply versus demand versus need versus utilization: Demand signifies what consumers want and can pay for through some means. Need represents the care that people want or need because of medical conditions or concerns. Utilization denotes the health care services actually used by consumers.
- Costs and benefits: In a workforce program, the costs and benefits are based on who pays and how much, and who benefits and how much should be examined.
- Supply versus demand shortage approaches: Shortages to whom? A geographic area can have both shortages and adequate workforce because of factors other than geographic proximity. Local access to care can be curtailed by many factors (e.g., perceptions, prejudice, and ability to pay).
- Data availability, comparability, and quality: Workforce analysis and policy are influenced by what data are available and its quality and detail and how it compares to other data sources and across time. It is important to examine what the analyses do not show because of data problems, and to note which findings are artifacts of poor data.
- Projection predictions versus sensitivities: As hard as we try, nearly all workforce projections miss the actual mark because of methodology, poor data, or unforeseen changing circumstances. A major contribution of projection models is their ability to allow testing of the sensitivities of changes in factors that might contribute to a workforce solution (e.g., how does delaying retirement on average by two years influence future provider shortages).
- Percentages versus absolute numbers: For instance, a large percentage change can only represent a small change in absolute providers and a large provider number change can represent a small percentage change.
- Recruitment versus retention: With regards to workforce research and policy analyses, recruitment and retention are two sides of the same coin. Much more attention is paid to recruitment. Retention – keeping providers once they have been recruited – reduces the need to recruit as much and is a key factor to being able to recruit well when needed.
- Primary care/generalist versus partialist/specialist: It is important to differentiate primary (generalist) care from specialist care in workforce analyses and discussions. While primary care/specialist are most often denoted for physicians, it is important to recognize that this differentiation is also applicable to many other provide types such as nurse practitioners (NPs) and physician assistants (PAs).
- Tradeoffs between access, cost, and quality: There are nearly always tradeoffs between these three aspects of health care delivery. With finite resources, it is important to understand who gains and who loses regarding access, cost, and quality of care.

Of course, there are many other factors that could be listed but these provide a basic checklist to keep in mind when examining workforce issues.

Demographics

Depending on which rural definition is used, there are between 50 and 60 million rural residents in the United States. During its history, the United States has evolved from a rural agricultural society to one dominated by its urban population. Roughly 20 percent of the U.S. population resides within rural areas. Approximately three-fourths of the Nation's counties are rural, as is 75 percent of its landmass. While the rural population is in the minority, it numbers approximately the same as France's total rural and urban population.

While many would prefer a single standardized, all-purpose definition of rural, rural is a multifarious set of concepts about which there is not universal concurrence. Describing what rural is can be elusive and frequently depends on stereotypes and personal experiences. While the term rural suggests pastoral landscapes, unique demographic structures and/or settlement patterns, isolation, low population density, extractive economic activities, and distinct socio-cultural milieus—these aspects of rurality fail to completely define rural. Rural “cultures” can exist in urban places. Only a small fraction of the rural population is involved in farming and towns range from tens of thousands to a handful of residents. The proximity of rural areas to urban cores and services may range from a few miles to hundreds of miles (Hart, Larson, & Lishner, 2005). Only by defining rural appropriately can we discern differences in health care issues and outcomes across rural areas and between rural and urban locales. The definition of rurality employed for one purpose may be inappropriate or inadequate for another.

On average, rural populations have relatively: more elderly and children; higher unemployment and underemployment; lower population density; higher percentages of poor, uninsured and underinsured residents; and are more vulnerable to economic downturns because of their concentrated economic specialization, than their urban counterparts. Other unique circumstances include longer travel distances to, and associated costs with, needed health care services; diseconomies of scale; high rates of fixed overhead per patient revenue; fewer health care providers and a greater emphasis on generalists; health care facilities with limited scopes of service; fragile hospitals with high closure rates; different clinical practice behaviors, practice arrangements and reimbursement levels; greater dependency on Medicare and Medicaid reimbursement; and higher rates of chronic diseases, motor and other accidents, and obesity (e.g., Hart, Larson, & Lishner, 2005; Ricketts, 2001; Geyman, Norris, & Hart, 2001; and Loue & Quill, 2001).

The main demographic trends during the 2000 through 2008 period can be summarized under the following five labels: 1) non-metro population growth slows, 2) amenities fuel rapid population growth, 3) natural increase or decrease on the rise, 4) diversity increases, and 5) challenges for the aging population (ERS web page: <http://www.ers.usda.gov/Briefing/Population/Rural.htm>). Since 1980, the rural population has increased by nearly 4.4 million residents (holding the county definition constant based on the 2003 definition). The population growth in the Nation’s rural areas per year dropped from 1.0 percent from 1990-1999 to .4 percent during the 2000-2005 period (over 1.1 million increase) compared to an urban rate of 1.2 percent for this later period. The rural areas with natural amenities during the 2000-2005 period grew at rates above 2 percent and the largest population declines were in midwestern States where deaths significantly exceeded births (e.g., Kansas, Iowa, Illinois, North Dakota, and Nebraska). During the four-year period ending in 2004, the percentage of the rural population aged 65 and older increased by 2.3 percent. The 7.5 million elderly rural residents have lower income, less education, higher dependence on social security, and are growing faster in number than their urban counterparts. The Hispanic population was the fastest growing segment of the rural population. Amenity rich rural areas are growing, especially as the elderly move to them. In other rural areas, substantial numbers of the young adults are moving to urban areas.

While this summary is generally true in the aggregate, few rural locations have all of these attributes and some differ dramatically from the norm. Places like Sun Valley, Idaho do not fit the general mold. There are huge intra rural demographic variations from region to region, State to State, within States. The 33 RUCA codes (based on Census tracts or ZIP code areas) can be aggregated into four categories: urban, large rural, small rural, and isolated small rural

(<http://depts.washington.edu/uwruca/uses.html>). The three rural categories are dramatically different in demographics, health care needs, and the supply and nature of the health workforce. Generally speaking, the large rural communities are often as much like small and medium population urban cities as smaller rural communities. The most significant health workforce issues regarding shortages and poverty and other adverse demographic factors are evident in the small rural and isolated small rural communities. For example, in 2004 the percent of the population in the four categories who were 65 and older was: urban, 11.9; large rural, 14.1; small rural, 15.2; and isolated small rural, 16.5 (<http://depts.washington.edu/uwruca/demog.html>). The percents of the Nation's populations in each of the four categories were: urban, 81.0; large rural, 9.6; small rural, 5.3; and isolated small rural, 4.1. Regional variations are meaningful (e.g., more poverty in South).

The environment where rural primary care providers practice differs enormously, both across rural areas and between rural and urban areas (Rosenblatt, 2001; Ricketts, 1999). These providers practicing in smaller and more remote rural towns practice in a medical care delivery system characterized by financially vulnerable medical organizations, small populations, long distances to specialists and tertiary hospitals, longer practice hours, lack of collegial support, limited access to advanced technologies, and relatively high fixed costs per delivered service. This milieu creates especially difficult circumstances for rural providers and populations. Rural practice issues such as patient privacy, clinical adaptations in the absence of nearby specialists, generalist scarcities, quality assurance programs, compliance to the Health Insurance Portability and Accountability Act of 1996 regulations, and continuing medical education are different than those of their large city contemporaries—with potential impact on health outcomes (Hart, Larson, & Lishner, 2005). For example, studies demonstrate substantial differences in clinical prenatal and intrapartum practice styles between rural and urban physicians for similar low-risk patients, without apparent differences in outcome (Hart et al., 1996). While there are many common threads between urban clinical medicine and its rural cousin, there are many substantive differences (Geyman, Norris, & Hart, 2001; Glasgow et al., 2004; Loue & Quill, 2001; Baldwin et al., 2004; Baldwin et al., 1999). When compared to their urban counterparts, the rural population generally has worse health status, higher rates of smoking and tooth loss, and poorer access to essential treatment such as cancer services (Baldwin et al., 2008).

The most numerous rural health care providers by type are (in thousands): RNs, 281; LPNs, 110; physicians, 85 (MD, 82 and DO, 3); pharmacists, 31; dentists, 20; NPs, 13; dental hygienists, 10; PAs, 6; and certified registered nurse anesthetists, 6; optometrists, 5; and CNMs, 1 (Hart et al., 2002). Some of the allied health types might be more numerous than listed provider types but comprehensive rural data were not available.

Physicians

Because primary care is so important to rural America, especially the smaller and more remote communities, the emphasis here is on primary care physicians.

Generalist Physicians

In 2005, the patient care generalist physician to 100,000 population ratios was as follows: urban, 72; large rural, 61; small rural, 59; and isolated small rural, 36 (the 36 represents 4,336 generalist physicians) (Fordyce et al., 2007). The corresponding total patient care physician ratios were: 209, 147, 99, and 52. In rural persistent poverty counties the ratio for isolated small rural communities was 20.4 and it was 30.5 for small rural communities. Generalists represent 68 percent of the patient

care physicians within isolated small rural communities and 59 percent of those in small rural communities. Patient care generalist osteopathic physicians were more likely to practice in rural areas than their allopathic counterparts (21 percent versus 15 percent). They were also much more likely to be generalists (58 percent versus 35 percent). Twenty-five percent of all patient care generalist physicians were international medical graduates (IMGs) – a percentage that is likely to increase with the recent high levels of IMG matches into family practice (FP) residencies (Fordyce et al., 2007). IMGs are less likely within rural areas to practice in isolated small rural communities and persistent poverty counties than U.S. medical school graduates (Hart et al., 2007). Non-physician primary care providers and FPs are more likely to care for underserved populations in rural communities (Grumbach et al., 2003). Federal programs such as Title VII have been shown to be associated with an increased likelihood of physicians practicing in community health centers and the National Health Service Corps (Rittenhouse et al., 2008). Other basic workforce trends and characteristics related to rural physician workforce follow.

The number of physicians has increased dramatically since 1940 (Figure 1). However, rural counties without large towns and not adjacent to metro areas have increased relatively little. Smaller and more isolated rural communities are more dependent on generalist physicians for their care (Figure 2). The supply of patient care generalist physicians differs widely from State to State (Figure 3); the percent of all physicians who are osteopathic varies widely by State (Figure 4); and the percent of physicians who are international medical graduates varies widely by State (Figure 5). The characteristics of IMGs have changed during the past two decades (e.g. countries of origin) (Hart et al., 2007).

Here are some of the recent and relevant generalist physician developments:

- decreases and stagnation in the match of medical students into family medicine, general internal medicine, and general pediatric residencies since 1992, as population increases,
- increase in proportion of IMGs matching into generalist specialties across this period (approximately one in four rural physicians are IMGs),
- continued Federal freeze of the number of residents with minor adjustments,
- increase in H1-B and decrease in J1-visas during the last five years,
- dramatic increase in the proportion of medical school graduates who are female,
- Association of American Medical Colleges (AAMC) call for increases in the number of medical school graduates to avert shortages (30 percent increase),
- increases in medical school class sizes and building of additional medical schools (both MD and DO),
- Walmart and Walgreens start wide spread opening of walk-in primary care clinics,
- continued increases in the numbers of NPs and PAs, with increases in their specialization, and the new potential for health care and payment reform.

The combination of these developments and their synergism can further threaten the supply of generalist physicians in rural areas, especially small rural, isolated small rural, and frontier communities. It is not clear that female medical school graduates will be as likely as their male counterparts to practice in smaller and more remote rural towns – there is some evidence that this has not been the case in the past. There seems to be little assurance that the expanded class sizes of medical schools will result in the production of substantially more generalist physicians for the same reasons that have existed in the past. Empowered State legislatures could require such a change in priorities but this is unlikely to happen. As U.S. medical school classes increase the size of their graduating classes and if residency position caps are not increased, the numbers of IMGs able to find residency positions will decrease and threaten the viability of programs such as the Conrad-30

Program. Non-generalist residencies are likely to become even more dominated by U.S. medical school graduates, while the generalist residencies are likely to become more IMG-dominated. The net ramifications of these changes are liable to be a considerable reduction in the pipeline of generalist physicians into rural practice, especially in smaller and more remote communities. The accompanying population increases can lead to significant reductions in the Nation's rural generalist physician to population ratios (e.g., local access).

The location where physicians eventually practice has been shown to relate most significantly with where they grew up, went to medical school, and went to residency (Geyman et al., 2000). Most of the Nation's residency training takes place within urban locales and most of the rural training that takes place is family medicine residency training. A detailed study of year 2000 family medicine residency training by full-time-equivalents at the ZIP code level showed that only 7.5 percent of all family medicine residency training occurs within rural areas (Rosenblatt et al., 2002; Hart et al., 2005). Figure 6 illustrates how the locations of family medicine residency training compare to the U.S. population. Most of the large rural residency training takes place in residencies whose location is within a large rural community (85 percent of it)(Figure 7). In small rural and isolated small rural communities the vast majority of the training comes from residency programs based in urban areas (83 percent and 81 percent). Figure 8 shows the great variation in the amount of family medicine training by State and its rural/urban mix and Figure 9 and 10 illustrate the large range in the amount of rural family medicine.

The bottom line here is that there are too few generalist physicians practicing in rural communities and the amount of rural residency training is woefully low. This can be illustrated by examining the findings from a 2004 workforce survey of all of the Nation's Federally Qualified Health Centers (Rosenblatt et al., 2006). The overall response rate was 79 percent, but the rural Community Health Center (CHC) rate was 98 percent. Figure 10 provides the numbers of Full Time Equivalent (FTE) vacancies being actively recruited, as reported by the CHCs. As can be seen, there were 429 FTE vacancies for FPs, 115 for general internists and 102 for general pediatricians, and lesser numbers of other physician specialties. In some cases, after not being able to fill a vacancy for an extended period of time, the CHC stopped its recruiting activity. The overall vacancy rates for FPs, general internists, and general pediatricians were 11, 9, and 9 percent. By way of comparison, the national RN vacancy rate is usually put at 10 or 11 percent. Figure 12 shows that the FP vacancy rate by location type was: urban, 12; large rural, 13; small rural, 19; and isolated small rural, 19 percent. Vacancy numbers and rates for other provider types are provided under their headings. This study's findings substantiate that the shortages of rural generalist physicians are substantial and increase with isolation and small populations. Figure 13 shows the percentage of CHC physicians that were currently serving obligations by geographic location type. The combination of J-1 visa waiver, State loan, and NHSC loan and scholarship physicians made up a substantial proportion of the CHC's physician workforce: urban, 25; large rural, 40; small rural, 48; and isolated small rural, 57 percent. In other words, 57 percent of the physicians working in the CHCs in isolated small rural communities were working off obligations from one of the four programs.

Specialists (aka: Partialists)

It is impossible here to address the rural aspects of the well over 100 different types of nongeneralist physician specialists. Specialist physicians are important to consider when examining rural health workforce because they represent half of rural physicians, albeit located predominantly in the larger rural cities and towns. Certainly there are rural shortages of some of the most central types of rural specialists: obstetricians/gynecologists, emergency physicians, and psychiatrists. As the demography

section implied, the need for rural geriatricians will increase dramatically in the face of a critical national scarcity. Rural areas have half or fewer of nearly all of the specialties per 100,000 people, with large rural being much better off than small and small and isolated rural communities (Larson et al., 2003). This translates into lower rural utilization. For instance, Medicare beneficiaries from small rural and isolated small rural communities had relatively fewer visits with specialists, fewer overall visits, and traveled longer for their visits than their urban counterparts (Chan, Hart, & Goodman, 2006). However, they did have proportionately more visits with generalists.

One of the most critical rural specialist types is general surgery. Surgeons are essential in remote areas in traumatic and emergency situations. They are also important to the financial bottom line of smaller rural hospitals. Small/isolated small rural communities have 29 percent fewer general surgeons than urban cities, with the urban cities having many surgeons of other types and these rural communities have nearly none. Large rural cities/towns have 18 percent more general surgeons than urban cities (Thompson et al., 2005). During the last decade, the general surgeon to 100,000 population ratio dropped by 21 percent. Rural general surgeons are older than their urban counterparts and are proportionately more male. The proportion of general surgeons who are older is higher now than any time during the past 25 years (Lynge et al., 2008). Extremely little general surgeon training takes place in rural locales and few programs provide any structure to help train rural general surgeons.

In addition, there is a shortage of obstetrical care within rural areas, with rural areas having about half as many FTEs of provider care as urban areas. There is a need to expand obstetricians, FPs, and certified nurse midwives care within rural areas. Any such efforts would need to include changes that involve the ability of rural hospitals to include obstetrics within their scope of services.

Registered Nurses

One of the critical issues to emerge since 2000 is the shortage of RNs and the prospect that the shortage will intensify as the RN pool ages and retirements significantly outnumber new graduates (NAPNEP, 2008). As a consequence, the mean age of RNs is increasing – estimates of the national RN shortage across the next decade range from half a million to a million RNs (AACN, 2008a). The 2004 RN to population ratios by work location type were as follows: urban, 853; large rural, 837; small rural, 665; and isolated small rural, 369 (the corresponding ratios by RN residence were 833, 803, 782, and 753) (Skillman et al., 2007). Between 1980 and 2004, an increasing percentage of RNs residing in rural areas commuted to urban cities and larger rural communities to work. For instance, nearly half of the RNs residing in isolated small rural communities commuted to urban and large rural communities to work, compared to less than one in four in 1980 (see Figure 14).

A recent RN projection study in Washington State shows that if 400 additional RN graduates miraculously appeared in 2010 and each year into the future, it would be approximately 2025 before the supply catches up with demand (Skillman, Andrilla, & Hart, 2007).

While the study examined various scenarios that would increase RN supply (e.g., delayed retirement), only the large expansion of graduating class size held any promise of ameliorating the shortage – and this is in a State whose vacancy rates are not near the highest in the Nation. As previously indicated, rural health workforce shortages vary dramatically from State to State and RNs are no exception. The range in 2000 across States was from 87 to 377 full-time RNs per 100,000 population and the numbers of part-time RNs also varied widely (Larson et al., 2003).

This national situation is compounded by a growing shortage of nursing faculty. In 2007, over 70 percent of nursing schools reported they turned students away because of faculty shortages – with an associated faculty vacancy rate of nine percent (AACN, 2008).

Two simultaneous movements are complicating the current and projected critical shortages of RNs. There are strong initiatives to increase the numbers and proportion of RNs who have Bachelor of Science in Nursing (BSN) degrees (as opposed to associate and diploma program RNs). Master of Science in Nursing (MSN) degrees are also increasing. It takes four years to educate a BSN and two years for an associate RN and three years for a diploma RN. Supporters justify this change as needed to increase the quality and breadth of RN practice. In fact, some hospitals are touting that their entirely BSN staff as a measure of their high quality care. At the same time, the Nation's community colleges produce over half of the Nation's RNs – diploma and associate. Rural communities have proportionately fewer BSNs than do urban cities (51 percent versus 36 percent in 2004) (Skillman, Andrilla, & Hart, 2007; Skillman et al., 2006). Thus, during a time when there are large RN shortages and projections of even greater scarcities, fewer RNs may be produced because of the longer training time for BSNs and because of the need for even more nurse faculty. This is especially critical for rural areas where access to the BSN programs is worse than for potential urban students. RN to BSN online programs are expanding rapidly and may be a way to allow both needs to be satisfied. These online programs supplement the associate degree and diploma RNs with non-clinical training (e.g., leadership, professional communication, patient advocacy, public health, and quality of care indicators) and basic Bachelors of Science curriculum so they can receive their BSN degrees. While the number of foreign trained RNs has increased over the past decade, in 2004 they represented only 1.3 percent of all RNs.

As described above for generalist physicians, a detailed study of CHCs was performed that examined rural and urban provider vacancies (Rosenblatt et al., 2002; Hart et al., 2005). There were 379 FTE RN vacancies in the Nation's CHCs, with an overall vacancy rate of 10 percent. Figure 15 shows that the vacancy rates varied by rural-urban status: urban, 11; large rural, 9; small rural, 4; and isolated small rural, 13 percent.

Certified registered nurse anesthetists (CRNAs), licensed practical nurses (LPNs), clinical nurse specialists, and nurse midwives are valuable to the rural health workforce. In particular, CRNAs provide the only anesthesia coverage in two-thirds of the Nation's rural hospitals and there is a growing nationwide shortage of CRNAs.

Physician Assistants and Nurse Practitioners

During the last 40 years, the numbers of PAs and NPs has grown dramatically. The Nation now has approximately 110,000 PAs and NPs with approximately 11,000 graduating yearly (Hooker, 2006). The original scopes of practice for NPs and PAs have broadened over the years and their status across the 50 States and District of Columbia has been solidified, in addition to many other professional, reimbursement, and legal issues (Hooker & Cawley, 2003). As their numbers have increased, it is clear that PAs and NPs are contributing substantially to rural primary care. For instance, it was shown in one State that they provided a quarter of all the rural primary care ambulatory visits (Larson et al., 2003).

When discussing the rural role of NPs and PAs, it is important to differentiate between those who can be characterized as primary/generalist care and those who are specialized. Just as in medicine,

there has been an ongoing trend for larger proportions of PAs and NPs to specialize. PAs have gone from being 70 percent primary care in 1974, to 41 percent in 2007 (Hooker & Cawley, 2003). Because of the way NP data has been collected and perceived, it is difficult to identify NP primary care versus specialty status. A study in Washington estimated that rural NPs were 38 percent generalists (Larson, Ballweg, & Hart, 2001). Further, it was estimated that the ratios of FTEs to head counts for generalist physicians, NPs, and PAs were 66, 47, and 71 percent (e.g., for every 100 head count PAs there were 71 FTEs of care being provided).

In 2001, 82 percent of PAs practiced in metro areas and 18 percent in non-metro areas – close to the population distribution (Larson & Hart, 2007). An earlier study estimated that 19 percent of PAs practiced in rural areas (Larson & Hart, 1999). In 2000, about half of PAs nationwide were practicing in the State in which they were trained. In North Carolina, the ratio of NPs to 10,000 population in 2005 was 2.0 for non-metro and 3.2 for metro areas (North Carolina Health Professions Data System, 2007). In California, 12.4 percent of NPs and 16.0 percent of PAs practiced in rural communities (in addition to 16.1 percent of certified nurse midwives). Just a little over 13 percent of California's population resided in rural communities (Center for California Health Workforce Studies, 2000).

A similar detailed study of CHCs was performed that examined rural and urban provider vacancies (Rosenblatt et al., 2002; Hart et al., 2005). There were 195 FTE NP vacancies and 80 FTE PA vacancies in the Nation's CHCs, with overall vacancy rates of 9 and 7 percent. Figure 15 shows that the NP vacancy rates varied by rural-urban status: urban, 9; large rural, 7; small rural, 7; and isolated small rural, 15 percent. Figure 16 shows that the PA vacancy rates varied by rural-urban status: urban, 7; large rural, 6; small rural, 6; and isolated small rural, 9 percent. These numbers and rates are far lower than for FPs and RNs. In both cases, the rates in isolated small rural communities were their highest.

Oral Health Providers

The recognition of oral health as an important component of the Nation's health, in general, and of the rural population's health, in particular, has substantially grown during the last decade (U.S. Department of Health and Human Services, 2000; and NACRHHS, 2004). Dental caries and other oral health conditions are more prevalent in rural populations than in urban, including for children.

Dentists

While urban areas have about 60 dentists per 100,000 population, rural counties without large rural cities have 30 dentists per 100,000. Rural dentists ranges from 20 per 100,000 population in New Mexico to 48 in Hawaii and differs, in aggregate, across the rural/urban hierarchy (e.g., from 25 to 38 per 100,000 population) (Larson et al., 2003).

During the last two decades the number of dental school graduates has remained constant except for a dip in 1993, while the population has continued to increase. This constancy, coupled with an increase in part-time dentists, has resulted in an overall decline in the number and full time equivalents of dentists per capita. It is estimated that half of all dentists will reach retirement during the next decade (NCSL, 2003). Other fiscal issues also threaten access to dentists for Medicaid recipients (e.g., 25 States have reduced or eliminated dental benefits and 37 States have frozen payment levels). Decreasing numbers of minority dental students create concerns over equity and their propensity to practice in communities where there is great need.

Because of the overwhelming need for better rural oral health, the clear effectiveness of prevention, and the lack of public health material covered in dental school, there needs to be more public health content included in the dental school curriculum. This will train and enable a new generation of rural generalist dentists to better influence oral health outside of their practice offices. There also needs to be renewed commitment to train generalist dentists. More and more dental students are choosing specialty training (Milgrom & Tishendorf, 2001).

Rural dentists are older than their urban counterparts and are likely to retire sooner. Thus, in general, rural areas already have shortages of generalist dentists, their dentists are older and will retire sooner, the overall national supply of dentists is declining, and the disproportionately poor rural population has less insurance coverage than in the past.

In a detailed study of CHCs that was performed examining rural and urban provider vacancies (Rosenblatt et al., 2002; Hart et al., 2005), it was found that there were 3,310 FTE dentist vacancies in the Nation's CHCs, with an overall vacancy rate of 18 percent. Figure 17 shows that the vacancy rates varied by rural-urban status: urban, 16; large rural, 24; small rural, 33; and isolated small rural, 27 percent. By any standard, these rates are exceptionally high and illustrate the dramatic dentist shortages in small rural and isolated small rural communities.

Dental Hygienists

Attempting to characterize the rural or urban workforce situation regarding dental hygienists is problematic. Dental hygienists in general and in particular rural dental hygienists are not studied often and their scope of practice and training vary dramatically from State to State. A recent study of four States showed that rural dental hygienist vacancy rates varied from 5.8 to 34.7 percent and that dental assistant rates varied from 4.1 percent to 11.8 percent (Andrilla & Hart, 2006). The scopes of practice and incomes also differed widely. As with dentists, hygienists are disproportionately underrepresented within rural areas and across the United States.

There is some activity regarding the training of an oral health professional that is equivalent to an NP (with a scope of practice in between that of a dentist and a dental hygienist). For example, Alaska is experimenting with dental health aides and the American Dental Association is pursuing the concept of a masters-level dental hygienist called an Advanced Dental Hygiene Practitioner. The production of significant numbers of such providers could lessen the influence of dentist shortages in rural communities if the programs are tailored to produce graduates who find such communities attractive.

Pharmacists

Pharmacists represent the third largest health care provider group in the Nation. There is recognition at the Federal level of a nationwide shortage of pharmacists. The evidence of and reasons for this shortage include: increased vacancy rates, increased volume of prescriptions, retail competition resulting in expanded store hours and new store openings, expansion of pharmacist role in medicine, increase in percentage of part-time pharmacists, and increased prescription insurance coverage (BHP, 2000). At the national scale, this has led to: recruitment of pharmacy faculty to other positions, reduced time for pharmacists to spend counseling patients, job stress and potential for prescription errors, service restrictions that decrease access to vulnerable populations (including residents of rural communities), and the move from BS to PharmD training with its increased time

in training requirements (BHPr, 2000). The pharmacy/pharmacist sector has had some noteworthy changes. Mail order prescriptions (and their lack of personal counseling), large chain stores providing pharmacy services in larger rural communities (e.g., Walmart and Safeway, which some argue do not integrate as well with the rest of the local health care system), and the closing of independent rural pharmacies (Klepser et al., 2008), are just some of the decade's critical issues. Under non-shortage situations and the appropriate conditions, pharmacists should provide many services other than filling prescriptions.

Rural pharmacists recruitment and retention are handicapped by: isolation from other health care professionals, low profit margins, competition from large retail chains and mail order companies, an increased proportion of pharmacists who are women where the local small rural communities may not meet their personal needs, and programs for the underserved that force residents to obtain their prescriptions elsewhere (National Advisory Committee of Rural Health and Human Services, NACRHHS, 2006). There are many State specific studies that show that the number of pharmacists per 10,000 population has decreased during the last decade at the same time that the average number of prescriptions handled by pharmacists has increased dramatically (31 percent between just 1992 and 1999) (BHPr, 2000). In North Carolina in 2005, urban cities had 92 pharmacists per 100,000 population while rural counties had 67 (North Carolina Health Professions Data System, 2007). In Texas in 2005, the pharmacist to 100,000 population ratio was 77 in urban cities and 53 in rural communities (down from 56 in 1999). Finally, in Alaska the vacancy rate for rural pharmacists was 26 percent with an overall State pharmacist to 100,000 population ratio of approximately 61. While there is not a lot of national rural data available on pharmacist vacancy rates and per capita ratios, there is consensus about a rural pharmacy workforce crisis and the NACRHHS calls for the Federal government to take action (NACRHHS, 2006).

Other Health Professionals

The other health disciplines are varied, numerous, and important to rural health care. They consist of physical therapy, occupational therapy, speech-language pathology and audiology, respiratory therapy, various technicians and technologists, emergency medical technicians and paramedics, medical records and health information technicians (and computer support and systems professionals), nuclear medicine technologists, radiologic technologists, dieticians and nutritionists, mental health workers of many types, chiropractors, naturopaths, massage therapists, public health professionals, various nontraditional providers (e.g., acupuncturists), medical transcriptionists, optometrists, diagnostic medical sonographers, podiatrists, speech-language pathologists, phlebotomists and the list goes on and on. These health professionals are exceedingly vital to the delivery of health care in urban locations and many of them are crucial to care provision in rural communities. Nevertheless, it is amazing how little we know about their supply and shortages in the Nation's rural communities. Cross training of health professions for rural areas where such expertise is needed, while the volume cannot support more additional providers, is essential. A recent national report highlights the critical needs of rural America regarding the emergency medical services workforce (NHISA, 2008).

Issues and Trends

It is obviously beyond the intent of this paper to review even a small portion of these health provider types regarding rural communities. Generally, what data there are come from state specific studies that often do not exhibit rural specific statistics or issues. A recent 2003 – 2004 survey of community general hospitals in Washington State showed that overall average hospital vacancy rates

for 21 allied health provider types ranged from 2.2 percent for dieticians to 16.7 percent for physical therapists (in comparison, the staff RN vacancy rate was 10.1 percent) (Skillman et al., 2004). State Workforce Investment Areas Workforce Development Areas (from Department of Labor Workforce Investment Area (WIA) Program funding) that were predominantly rural, had greater difficulty recruiting professionals from many of the types.

Some workforce provider types will emerge as major problems in the future. For instance, genetic counselors will be critically needed in greater numbers in the near future. With the genome medical breakthroughs, the rural population will need access to health professionals who can help guide them in making decisions. The number of such genetic tests and the host of clinical alternatives defy our wildest expectations. Many of the clinical alternatives will fall within primary care. Many of these tests will be available through generalist physicians who, in addition to nurses and other health care professionals, will require training. However, the detailed counseling and triaging will require genetic counselors. There are about 2,000 such counselors in the U.S. and nearly all of them are concentrated in urban medical centers (Cooksey, 2000). There is going to have to be an enormous expansion in training of genetic counselors and physicians and nurses. It seems clear that the supply will lag far behind the demand. It is important that the rural population share in the promise of these new technologies. This can only happen if rural access is included in the edict of training development objectives.

Some of the thorniest issues will involve the appropriate access to and mix of health professionals regarding such issues as military veterans returning from Afghanistan and Iraq with medical and emotional conditions that require treatment (NRHA, 2007; Weeks, 2008), recruitment and retention of a quality workforce (NRHA, 2005), and graduate medical education (GME) funding (NRHA, 2008), to name just a few. In addition, a host of other crosscutting issues should be addressed but are not included in this paper. For instance, workforce providers trained to ameliorate population racial/ethnic disparities and issues addressing the racial/ethnic disparities within provider types, and the nuances of the rural geographic maldistribution of providers, are not addressed but are critically important (Robert Graham Center, 2007; Turner et al., 2008). Additionally, the lack of access for the vulnerable elderly population is critically important to understand and remedy (Chan, Hart, & Goodman, 2006). The rural training and practice activities and policy issues are played out on a backdrop of environmental trends and activities. These national trends help mold the policies and possibilities regarding the rural health workforce.

Some of those trends are as follows:

- increased interest and activities regarding the Medical home/Health home,
- new workforce shortage area designations criteria (HPSA/MUA),
- genomic advances,
- health information technology (HIT) implementations,
- future funding of core Federal and State rural workforce programs (e.g., AHECs, CAHs, CHCs, NHSC, RHCs, and J-1 visa waivers),
- Pay for Performance implementation,
- on-line training (e.g., RN to BSN programs) proliferation,
- international medical graduates (IMGs) and other provider types (e.g., nurses) changes,
- willingness to allow non urban places to have a second tier health care system,
- Federal and State insurance coverage changes,
- increased DO medical schools and enrollment,
- expanded MD medical schools and enrollment,

- State legislature mandates,
- economic developments (including State legislature cutbacks on funding of health professional training),
- continued increase in proportion of female physicians,
- new administration (President Obama) policies,
- roles of providers (e.g., primary care physicians, nurse practitioners, and physician assistants),
- increases in student debt, and
- changes in insurance infrastructure (e.g., medical savings plans and managed care).

This list could be supplemented by a cornucopia of related trends. Since these trends are interrelated, what seems relatively straightforward to change in the rural health workforce agenda is often profoundly complex. And this complexity is compounded by the details of the funding of health provider education, provider payment (e.g., Medicare), and many other issues not discussed here.

Selected Recommendations

The following list of recommendations is general, selective, and brief by necessity. It does not include recommendations that are critical but politically or fiscally impossible or extremely unlikely to be implemented. For instance, recommending increased or universal health insurance is not included.

1. Educate State legislators about workforce issues regarding generalist/primary care and their authority and obligations to make medical and other health professional schools accountable for producing the types of providers that their States critically need (e.g., rural generalist physicians).
2. Include more public health content in the dentist and dental hygienist training curriculum.
3. HRSA should invest in expanding the RN to BSN online training programs and use their influence to include both the community college and university agendas in the solutions to the rural nursing shortages.
4. A higher proportion of the residency training in family medicine should be carried out in rural locales.
5. HRSA and other Federal and State entities need to better coordinate their activities to maximize their influence on rural workforce supply.
6. Further expand the NHSC and target the expanded service physicians to small and remote rural communities based on the community's characteristics and not the suspect HPSA designations.
7. For many rural-relevant health professions, HRSA and State legislatures should increase training production with a focus on training more students who will be more likely to practice in rural communities. As much of this training as possible should be performed within rural areas. Rural-oriented loans and scholarships also should be initiated or increased. Prevention and public health aspects of oral health should be integrated into the curriculum.
8. HRSA should commission a comprehensive tome (or separate monographs) that addresses the rural health workforce in an all-inclusive fashion. The document should be an amalgamation of the format of *The United States Health Workforce Profile* (New York Center for Health Workforce Studies, 2006) and the *State of the Health Workforce in Rural America: Profiles and Comparisons* (Larson et al., 2003). It should be as comprehensive as the former and as rural oriented and intra rural detailed as the latter. In addition to the standard professions

often examined, allied health professionals and others about which we know little but depend on greatly, should be examined. For those rural relevant and important professions where there is scant information, HRSA should invest in procuring more information to guide policy.

9. The NHSC should be expanded to include scholarship and loan repayment for pharmacists.
10. Increase Title VII and VIII funding to support the training of primary care providers and nurses with accountability so that it is truly generalists that are being produced.
11. Increase and start incentive payment programs (e.g., Medicare Incentive Payment Program) to pay incentives to providers who practice in rural areas based on the area's characteristics (e.g., status as a poor frontier community) and not HPSA/MUA designation.
12. HRSA should make it a priority to increase pharmacist training aimed at producing rural pharmacists and make it a priority to use the AHECs to integrate pharmacy students with the training of other health professionals in rural areas.
13. Significant HRSA and other incentives should be provided for training experiences for generalist physicians and other provider types to integrate training into underserved areas and especially in CHCs and RHCs.

Closing Comments

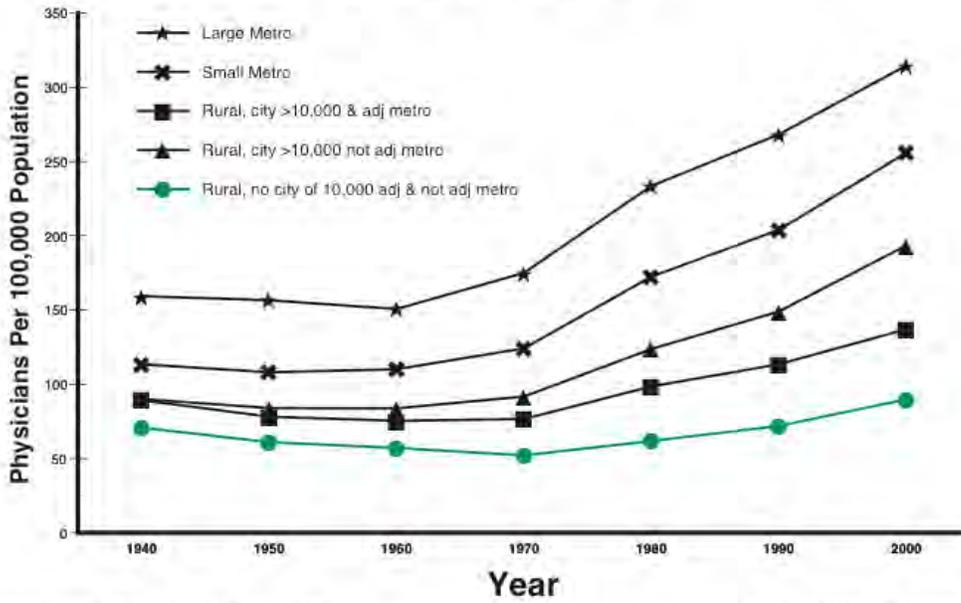
There is no shortage of relevant recommendations. In fact, nearly all the rural recommendations from a decade ago in the 10th Council on Graduate Medical Education (COGME) report entitled *Physician Distribution and Health Care Challenges in Rural and Inner-City Areas* are relevant and important today (COGME, 1998).

Nearly all the rural workforce recommendations from the annual NACRHHS reports are also relevant as are those from the recent health workforce conference of the National Organization of State Offices of Rural Health (NOSORH, 2008). There are a series of workforce conferences taking place wherein ameliorative rural and national health workforce policies are being debated and prioritized. For instance, HRSA is now planning its first agency wide health workforce summit.

Rural health workforce issues are so critical. That rural America is far behind urban America in access to appropriate health professionals is not an accident. It comes from the urban-centric biases of the legislative and executive branches of government and national health care organizations. Changes to meet the needs of the rural population regarding adequate health workforce can only result from formulating efficient and effective strategies based on sound research, and then laying them out forcefully in such a way that they cannot be denied. Finally, even if our training programs produce more providers, we can never expect to have an adequate supply of physicians and other health care providers in rural areas, especially the smaller and more remote communities, unless we create an environment where they are professionally, financially, and socially satisfied with their lives. Such an environment can only come about through concerted efforts at the national, State, and local level.

Figure 1

Active MD Physicians Per 100,000 Population by Year & Location*



* Groups of Urban Influence Codes (Dept Agriculture).

Source: DOGME 1998a & BHP, 2002

Figure 2

Percent Primary Care Physicians Within Geographic Type

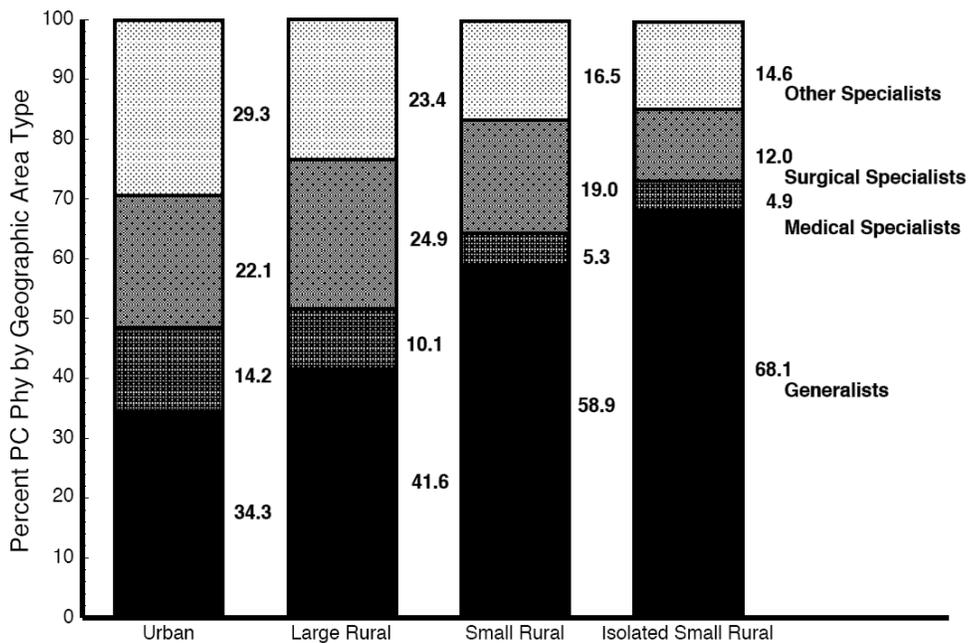


Figure 3

Generalist Physicians Per 100,000 Population by State for Isolated Small Rural Areas

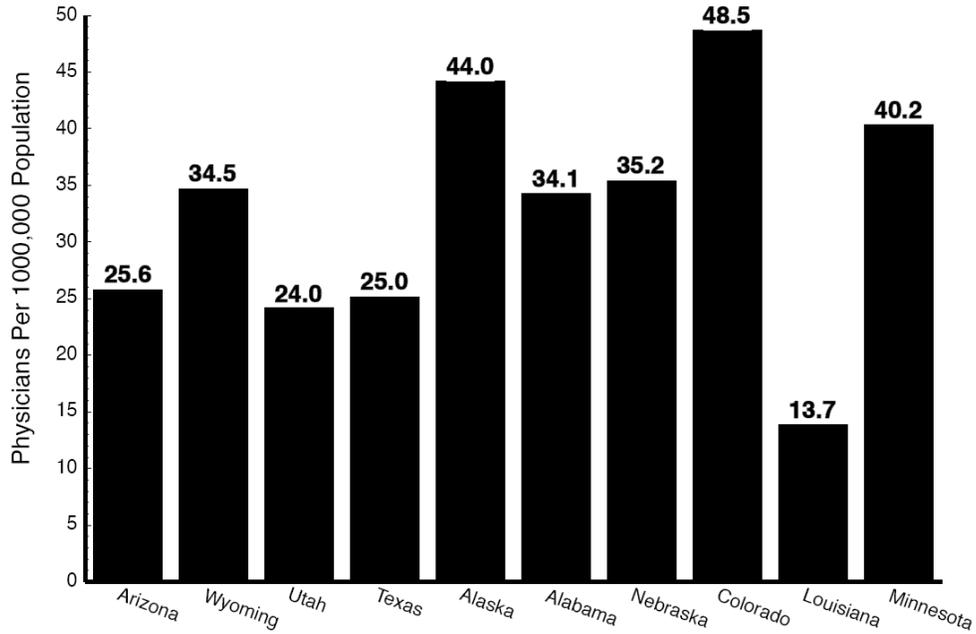


Figure 4

Percent of All Physicians Who Were Osteopathic Physicians by State

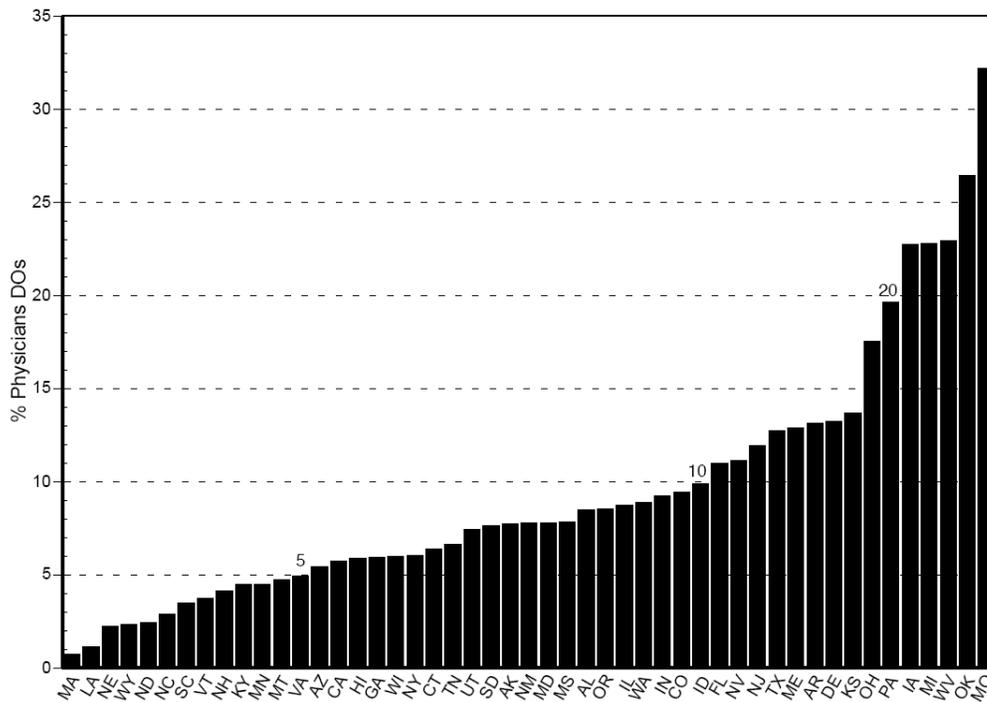


Figure 5

Percent of All Physicians Who Were IMGs by State

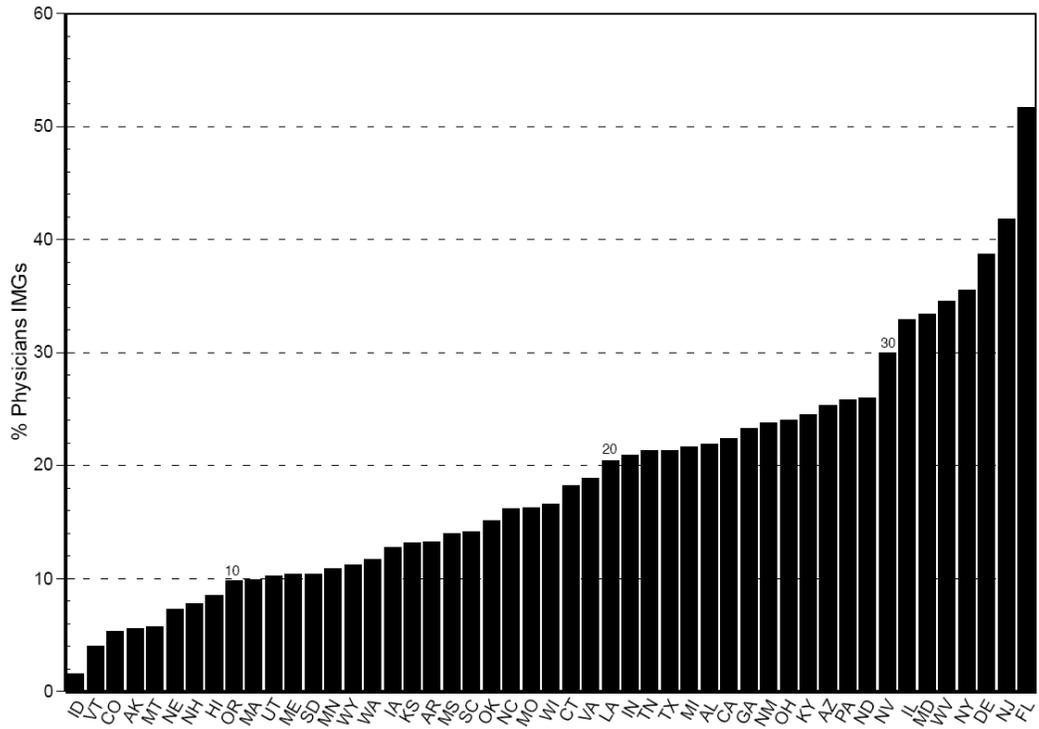
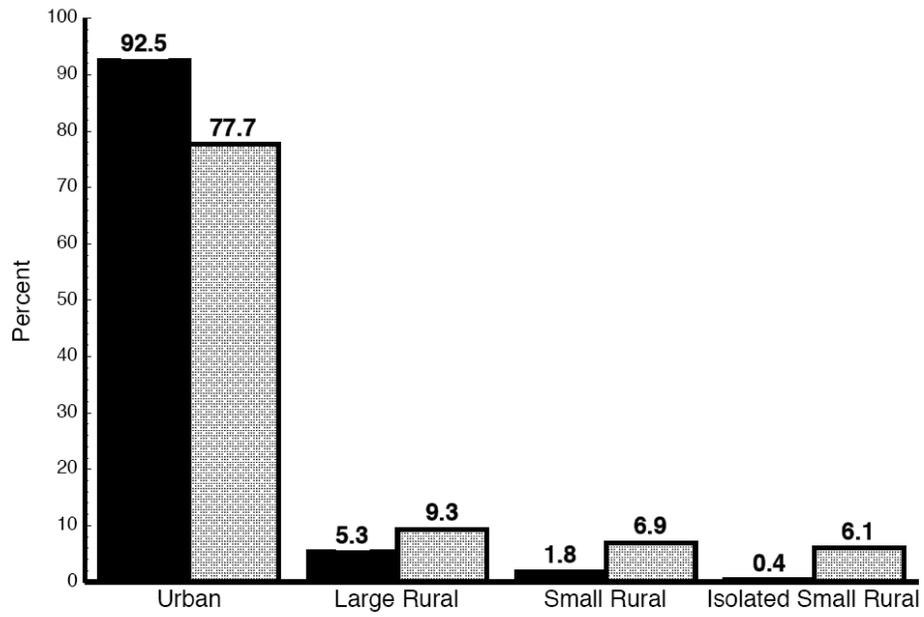


Figure 6

FTE FP Residency Training Location Compared to Population



Source: Adapted from data from Hart et al., 2005.

Figure 7

FM Residency Training by Location of Training and Parent Residency Location
(2000 FM Residency Director Survey, n= 435)

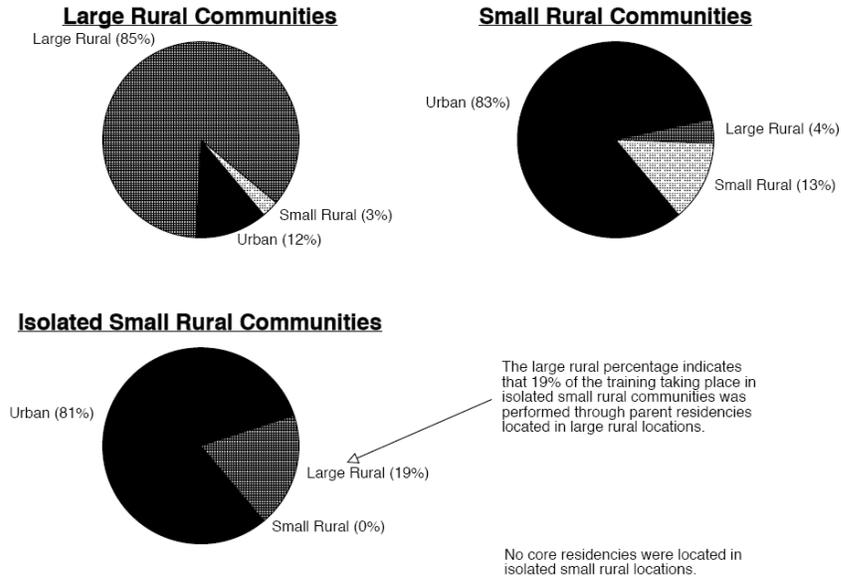
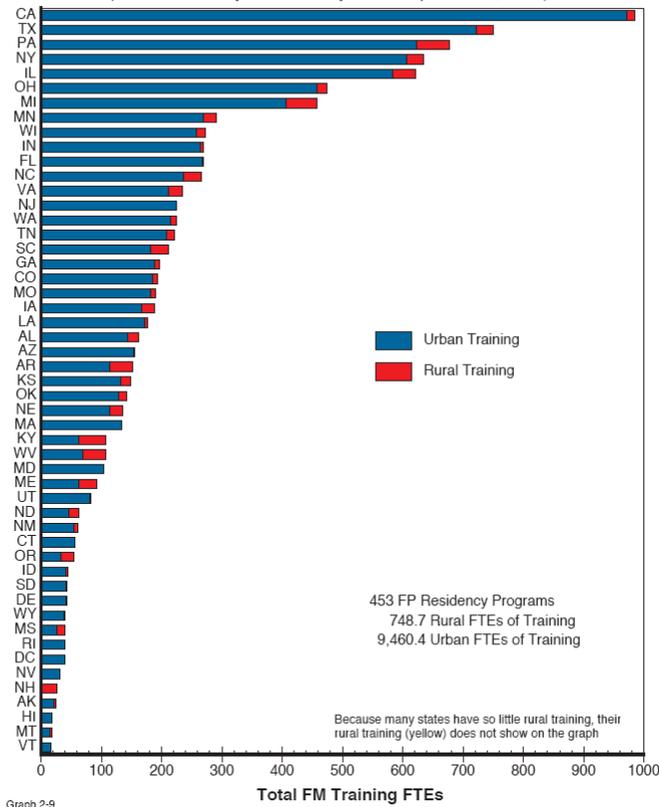


Figure 8

FM Residency FTE Training by State & Location
(2000 FM Residency Director Survey & Non Response Data, n=453)



Graph 2-9

Figure 9

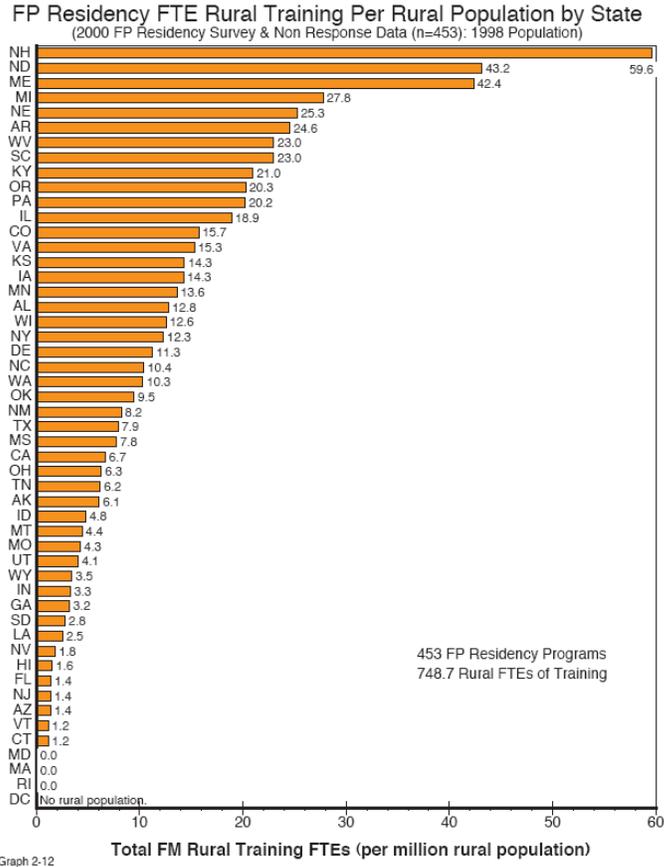
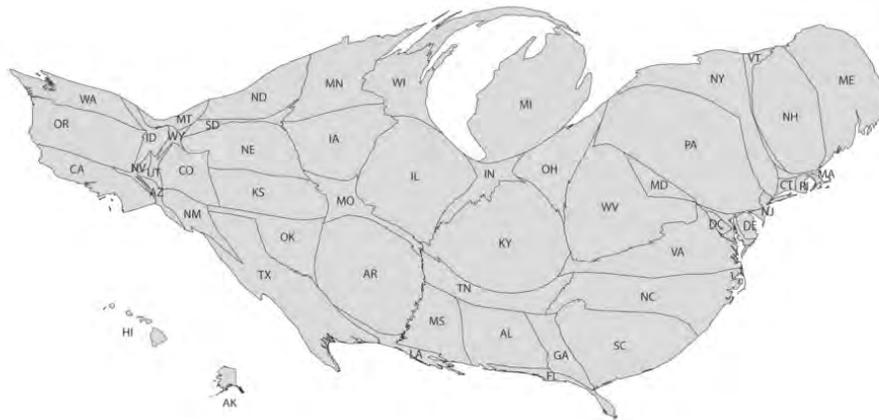


Figure 10

Cartogram of Total Rural Family Medicine Residency Training FTEs, by State (2000)



Area is proportional to the number of FTEs.

Source: Hart et al., 2005.

Figure 11

of Community Health Center FTE Vacancies Being Actively Recruited (2004)

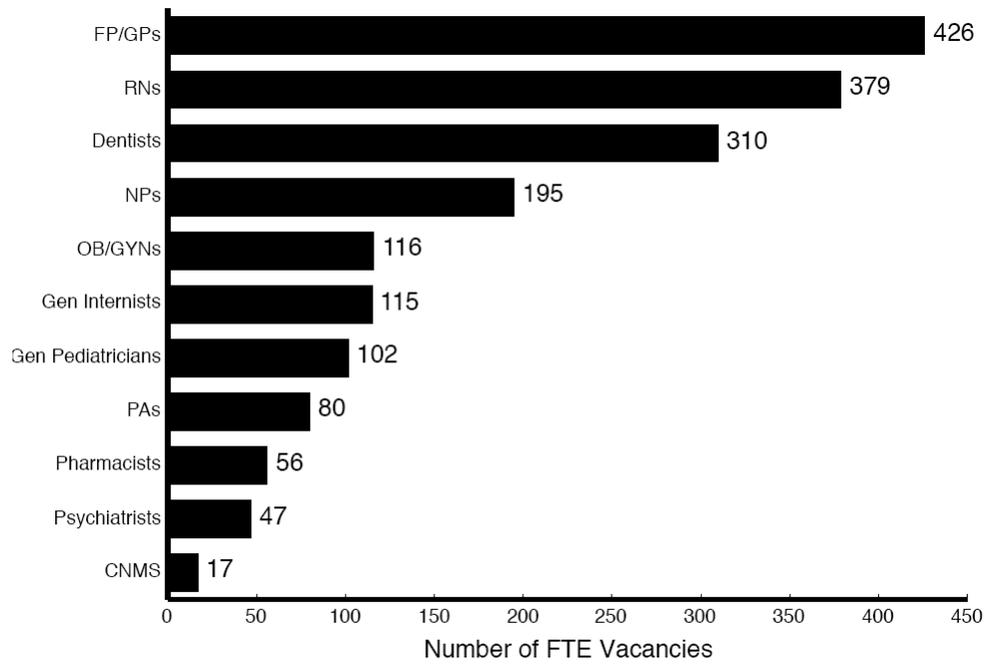
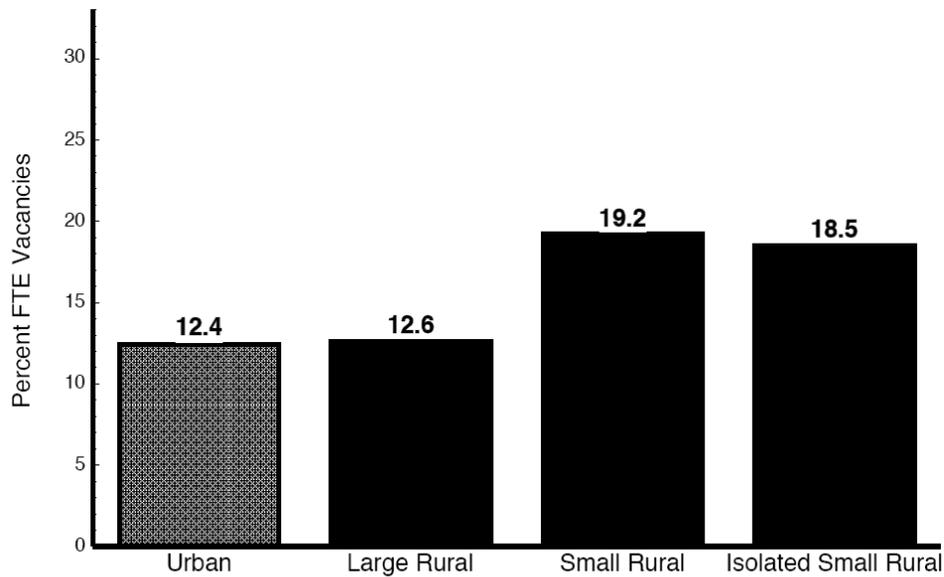


Figure 12

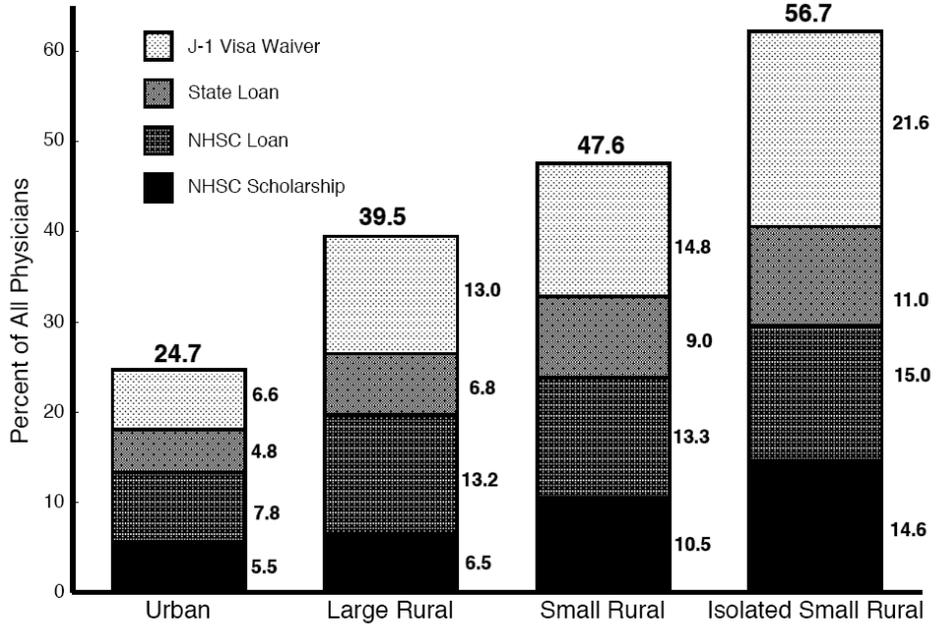
Family Physician Vacancy Rates by Location Type (2004)



Source: Adapted from data from Rosenblatt et al., 2006.

Figure 13

Current Obligation Serving Physicians as Percent of All Physicians by Obligation and Location Types



Source: Rosenblatt et al., 2006.

Figure 14

Work Location Type of RNs Living in Isolated Small Rural Areas

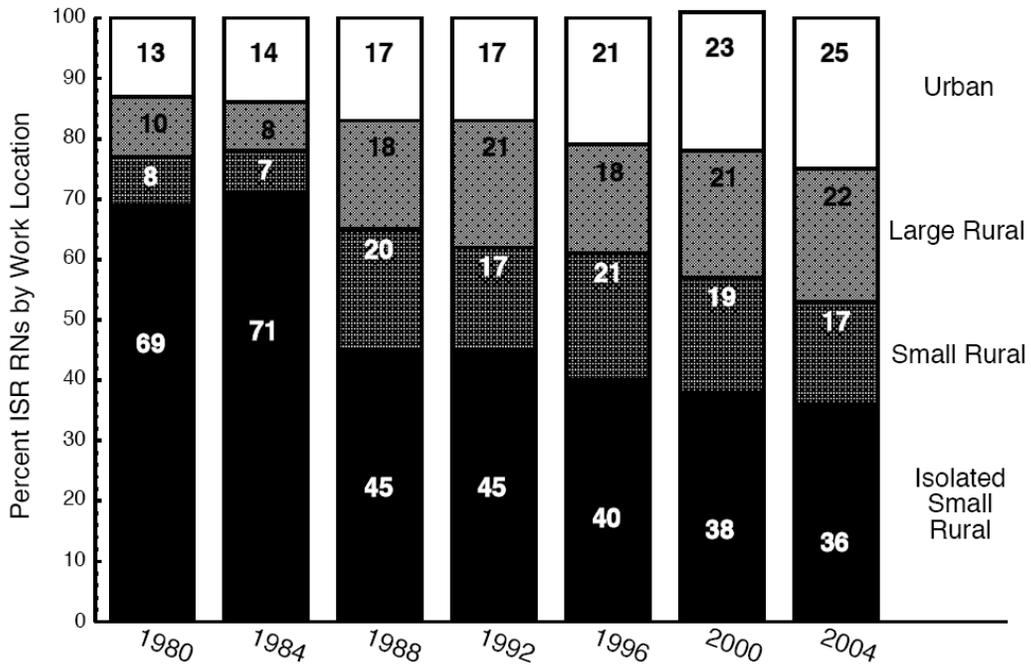
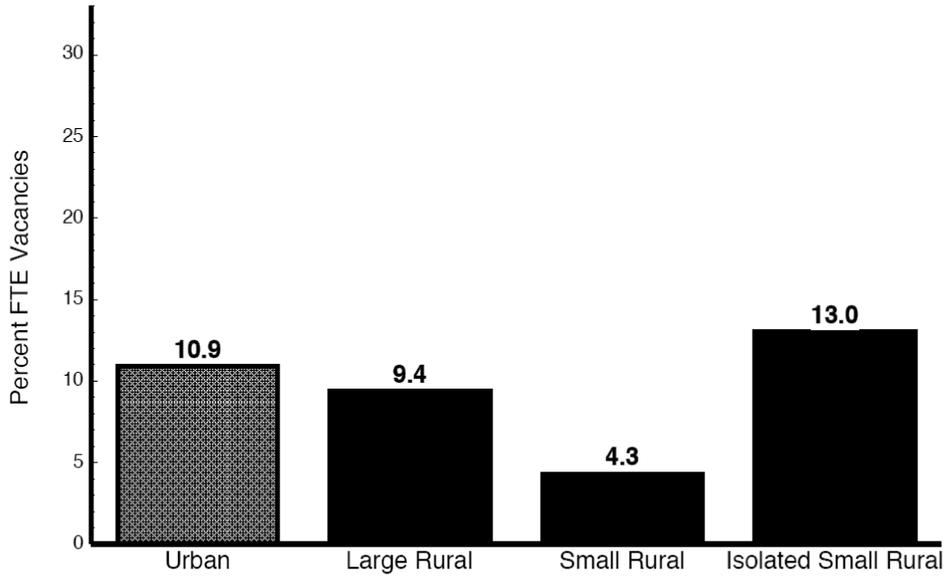


Figure 15

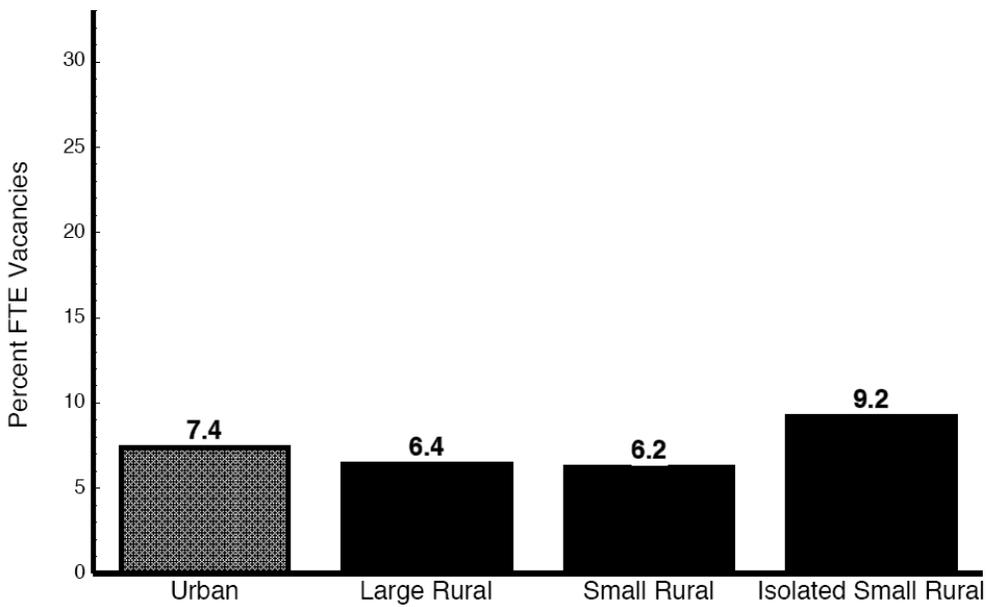
RN Vacancy Rates by Location Type (2004)



Source: Adapted from data from Rosenblatt et al., 2006.

Figure 16

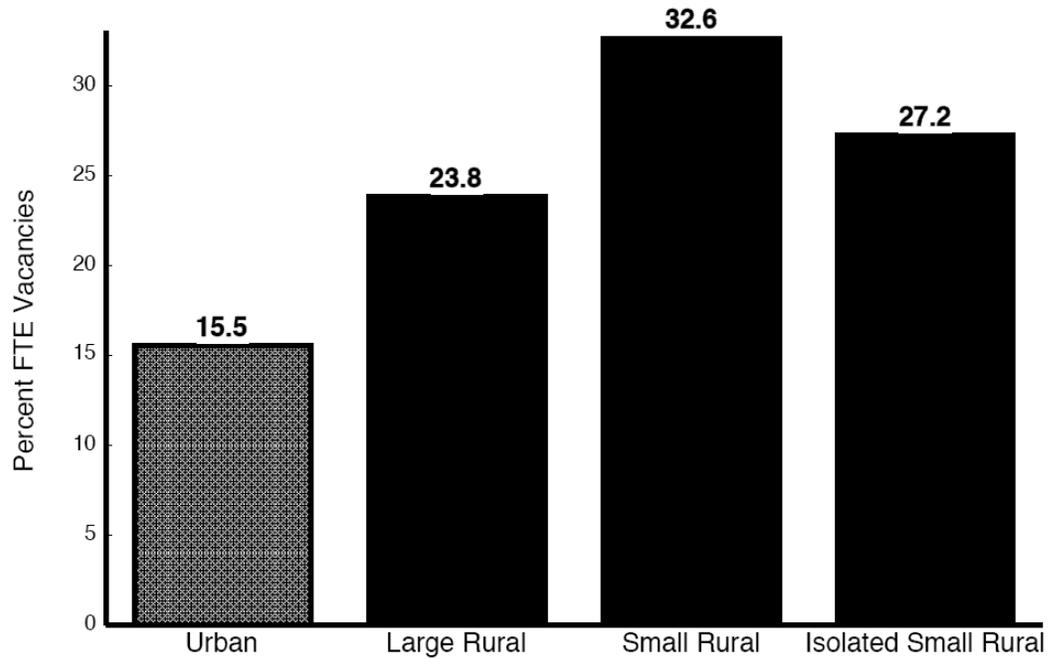
PA Vacancy Rates by Location Type (2004)



Source: Adapted from data from Rosenblatt et al., 2006.

Figure 17

Dentist Vacancy Rates by Location Type (2004)



Source: Adapted from data from Rosenblatt et al., 2006.

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CHAPTER 3.

ACICBL RECOMMENDATIONS

The Advisory Committee on Interdisciplinary, Community-Based Linkages (the Committee) has examined some of the issues that impact the rural health care workforce and its capacity to meet the needs of rural populations. Health care professional shortages, insufficient numbers of faculty members, demographic changes in the rural population, and less than fully supportive health care financing policies compromise the care of the rural health community.

In the face of these significant challenges, the Committee considered opportunities that exist within rural communities to expand access to health care services, promote better collaboration and coordination among providers, and implement and test innovative practice models that may afford rural residents a safer, more efficient health care delivery system. Additionally, the Committee discussed programmatic and policy changes to address the need for an expanded, highly trained rural health care workforce. Based on their deliberations and the testimony of many experts focused on the development of the rural health care workforce and delivery systems, the Committee developed a set of recommendations to enhance the training of the workforce and to improve the health care delivery systems. The proposed changes, if adopted and implemented concurrently, are intended to improve access to high quality health care for rural populations, reduce health disparities and improve the health outcomes of the Nation's most underserved populations.

The Advisory Committee on Interdisciplinary, Community-Based Linkages offers the following recommendations for programs and activities authorized under Sections 750-756 of the Public Health Service (PHS) Act: Area Health Education Centers; Education and Training Related to Geriatrics; Rural Interdisciplinary Training; and Allied Health and Other Disciplines.

TO THE SECRETARY, THE CONGRESS AND HRSA

- **DHHS as Federal Focal Point for Defining National Health Workforce Development Policy**

The ACICBL recommends to the Secretary and the Congress that the Department of Health and Human Services (DHHS) be the Federal department responsible for defining national health workforce development policy. Further, the ACICBL recommends that DHHS convene representatives of appropriate offices, entities or components within the Health Resources and Services Administration (HRSA); the Departments of Labor, Education, Commerce, Agriculture, Defense, and Veterans Health Administration given their actions in health workforce development and healthcare services delivery to coordinate strategies and actions addressing a national health workforce development policy.

- **Establish a National Advisory Council on Health Workforce Development Policy**

The ACICBL recommends to the Secretary and the Congress that legislation shall be authorized and funds be allocated to support the formation of a National Advisory Council on Health Workforce Development Policy to be administered by DHHS, HRSA. This Council shall be

responsible for the development of an annual report to the Secretary and the Congress articulating a national health workforce development policy and summarizing the practices addressing the policy. The Council shall be composed of experts in healthcare workforce development and services delivery, as well as direct care providers from both the public and private sector. The Council shall be informed by the deliberations of corresponding Councils and Committees within DHHS established by specific authority, purpose, and agenda, as well as by data and research generated or sponsored by DHHS entities and others.

- **Expand the capacity of DHHS/HRSA/BHPPr to conduct Health Workforce Data and Policy Analysis**

The ACICBL recommends that the Secretary and the Congress direct resources to expand the capacity of BHPPr, HRSA to sponsor and conduct additional research that quantitatively and qualitatively describes the health workforce and workforce development needs, and enables analysis of existing or proposed policy affecting the health workforce. Expanded research capacity shall include an analysis of interdisciplinary training and its potential to stimulate changes in the current and future health care delivery and payment systems.

TO THE HEALTH RESOURCES AND SERVICES ADMINISTRATION

- **Expand Training Linkages between Community Health Centers and Area Health Education Centers to Enhance Training of Primary Care Health Professionals**

The ACICBL recommends that HRSA adopt changes in the productivity levels of provider staff at Community Health Centers (CHCs) when they serve as preceptors for health professions students who participate in clinical rotations administered by Area Health Education Centers (AHECs). This will allow CHC clinical staff more time to train health professions students participating in clinical rotations. Adoption of this recommendation will contribute to an increase in the number of students who are exposed to primary care delivery and to the needs of underserved populations, and will increase the likelihood that they will choose a career in primary care and practice in an underserved area site, such as a CHC or another underserved area site.

- **Establish Funding Priorities for Interdisciplinary Training Approaches**

The Committee recommends that HRSA and BHPPr establish within Title VII and Title VIII programs funding priorities that emphasize interdisciplinary training for students, faculty and community preceptors with a particular emphasis on interdisciplinary programs that incorporate rural learning experiences. Further, the Committee recommends that interdisciplinary curriculum course objectives shall include the core competencies identified by the IOM: delivering patient-centered care, working in interdisciplinary teams, practicing evidence-based health care, focusing on quality improvement, and using information technology to support patient care. Additionally, the Committee recommends that HRSA shall study and report the significance of incorporating these core competencies into education and training, and the eventual impact on practice

location, quality of patient care and health outcomes, and also the impact on reimbursement by third parties.

- **Implement Demonstration Projects to Develop Best Practice Training Models of Interdisciplinary Teams of Professionals and Paraprofessionals**

The ACICBL recommends that HRSA and BHP_r shall allocate funds to develop and implement demonstration projects to create evidence-based, best practice training models that reflect competency-based, integrated-interdisciplinary teams of three or more health, allied health, and mental health professionals and paraprofessionals, including community health workers, patient navigators, and promotoras, for the delivery of health care to rural and urban underserved populations. Further, the Committee recommends the development and support of demonstration projects to evaluate the effectiveness of patient navigators in improving outcomes as members of interdisciplinary practice teams specifically serving rural populations at risk for health disparities.

<p style="text-align: center;">TO THE SECRETARY AND THE CONGRESS LEGISLATIVE CHANGES</p>

- **Health Care Financing and Health Care Reform: Reimbursement for Team Care**

In an environment in which a variety of strategies are proposed with regard to health care reform and potential changes to the existing health care delivery system and reimbursement methods, the ACICBL recommends that the Secretary support and the Congress authorize the payment of health care delivered by interdisciplinary teams in a manner that assures reimbursement across all member disciplines involved in that team's clinical services. To enhance the development of the future healthcare team-based workforce, the ACICBL recommends that changes should be made in the current allocation of Graduate Medical Education (GME) funds for future use to support inter-professional graduate education, training and services for all health professions being educated and trained in both hospital and community-based healthcare settings.

- **Cross-Training of Allied Health Disciplines**

The ACICBL recommends that the Secretary support and the Congress authorize and fund grants to expand cross training, credentialing opportunities, and core competencies across targeted allied health disciplines, to include, but not be limited to: medical assistants, pharmacy assistants, radiology technologists/technicians, laboratory assistants, and respiratory therapists. This expansion for pre-baccalaureate allied health occupations in rural health systems would positively impact personnel resources without significantly increasing employer costs.

- **Training and Reimbursement for Pharmacological and Psychopharmacological Services**

The ACICBL recommends that the Secretary support and the Congress authorize and fund education and training programs for nurse practitioners, clinical pharmacists, psychologists, and physician assistants to develop their clinical and practice competencies to provide pharmacological and/or psychopharmacological services in order to decrease prescriber

workforce shortages but augment access to care for underserved populations. Further, the Committee recommends that subsequently the Secretary support and the Congress authorize legislation that assures health care reimbursement (including Medicare, Medicaid, and private health care reimbursement mechanisms) for pharmacological and/or psychopharmacological services offered by these providers.

RECOMMENDATIONS with BACKGROUND and RATIONALE

<p style="text-align: center;">THE SECRETARY, THE CONGRESS, AND HEALTH RESOURCES AND SERVICES ADMINISTRATION</p>

- **DHHS as Federal Focal Point for Defining National Health Workforce Development Policy**

The ACICBL recommends to the Secretary and the Congress that DHHS be the Federal department responsible for defining national health workforce development policy. Further, the ACICBL recommends that DHHS convene representatives of appropriate offices, entities or components within HRSA and the Departments of Labor, Education, Commerce, Agriculture, Defense, and Veterans Health Administration given their actions in health workforce development and healthcare services delivery, to coordinate strategies and actions addressing a national health workforce development policy.

- **Establish a National Advisory Council on Health Workforce Development Policy**

The ACICBL recommends to the Secretary and the Congress that legislation shall be authorized and funds be allocated to support the formation of a National Advisory Council on Health Workforce Development Policy to be administered by DHHS, HRSA. This Council shall be responsible for the development of an annual report to the Secretary and the Congress articulating a national health workforce development policy and summarizing the practices addressing the policy. The Council shall be composed of experts in health workforce development and healthcare services delivery and direct care providers from both the public and private sector. The Council shall be informed by the deliberations of corresponding Councils and Committees within DHHS established by specific authority, purpose, and agenda, as well as by data and research generated or sponsored by DHHS entities and others.

- **Expand the Capacity of DHHS/HRSA/BHPr to Conduct Health Workforce Data and Policy Analysis**

The ACICBL recommends that the Secretary and the Congress direct resources to expand the capacity of BHPr, HRSA to sponsor and conduct additional research that quantitatively and qualitatively describes the health workforce and its development needs and enables analysis of existing or proposed policy affecting health workforce. Expanded research capacity shall include an analysis of interdisciplinary training and its potential to stimulate changes in the current and future health care delivery and payment systems.

BACKGROUND AND RATIONALE: With decreases in recent years in funds available to Titles VII and VIII programs, there have been associated decreases in the amount of funds available for health workforce analysis programs and policy development activities. Simultaneously, other Federal departments and agencies have begun to address the health workforce needs of their constituencies, resulting in duplication of administrative and program structures and competition for limited Federal financial resources. It is essential and appropriate that DHHS be identified as the leader in health care workforce analysis and policy development. The BHP_r within HRSA, DHHS has expertise and a long history of health workforce analysis and policy development. These workforce analysis programs must not be diluted by the creation of other programs in other Federal agencies. Furthermore, BHP_r programs must be appropriately funded to carry out this health workforce analysis and policy development agenda.

DHHS shall involve representatives of other Federal agencies and the private sector, to the extent possible, to participate in health workforce analysis and policy development activities. Participants shall include individuals/organizations representing expertise in health workforce development and/or health services delivery. Stakeholders may provide input on workforce analysis of specific health professions disciplines and/or analysis of inter-disciplinary training. Advice on health workforce needs of communities may be sought from community-based AHEC advisory boards and Department of Labor (DOL) workforce investment boards.

HEALTH RESOURCES AND SERVICES ADMINISTRATION

- **Expand Training Linkages between CHCs and AHECs to Enhance Training of Primary Care Health Professionals**

The ACICBL recommends that HRSA adopt changes in the productivity levels of provider staff at CHCs when they serve as preceptors for health professions students who participate in clinical rotations administered by AHECs. This will allow CHC clinical staff more time to train health professions students participating in clinical rotations. Adoption of this recommendation will contribute to an increase in the number of students exposed to primary care delivery and the needs of underserved populations, and will increase the likelihood that they will choose a career in primary care and practice in an underserved area site, such as a CHC or another underserved area site.

BACKGROUND AND RATIONALE: One of the eight Program Requirements of the AHEC Program is to: “Prepare individuals to more effectively provide health services to medically underserved areas or populations through field placements, preceptorships, conduct of or support of community-based residency programs, and agreements with community-based organizations such as community health centers, migrant health centers, Indian health centers, public health centers, and others”. HRSA encourages AHECs to provide clinical experiences for health professions students in underserved area delivery sites, e.g., CHCs. Research (Baldor et al, 2001; Ricer et al, 1997; Usatine et al, 1997) and information from Primary Care Association (PCA) Director (Laurie Wylie, personal communication, 2008) shows that precepting students usually decreases the productivity of the precepting provider, especially when the student is in an early phase of his or her education. The CHC providers are required by HRSA to meet productivity standards. The current outcome of this requirement is resulting in CHCs either not accepting students or as many students for clinical experiences, (Laurie Wylie, unpublished survey, 2008). It is essential that medical and other health professions students have these experiences at CHCs to create a workforce to serve rural and underserved populations.

Health professions students should be exposed to CHCs early in their education and training to create early interest in primary care careers and working with underserved populations. If students cannot access primary care practices focusing on underserved populations until later in their academic careers when they require less time of the preceptor, the likelihood of choosing that practice environment for a career is vastly decreased. In 2008, program data indicates that AHECs established training relationships with 1,900 CHC sites. As the number of CHC delivery sites continues to expand to more than 4,000, an opportunity exists for AHECs to establish training relationships at the new sites and expose more medical and other health professions students to a training experience in primary care and service to rural and underserved populations.

- **Establish Funding Priorities for Interdisciplinary Training Approaches**

The Committee recommends HRSA and BHPPr establish--within Title VII and Title VIII programs--funding priorities that emphasize interdisciplinary training for students, faculty and community preceptors with a particular emphasis on interdisciplinary programs that incorporate rural learning experiences. Further, the Committee recommends that interdisciplinary curriculum course objectives shall include the core competencies identified by the IOM: delivering patient-centered care; working in interdisciplinary teams; practicing evidence-based health care; focusing on quality improvement; and using information technology to support patient care. Additionally, the Committee recommends that HRSA study and report the significance of incorporating these core competencies into education and training, and the eventual impact on practice location, the quality of patient care and health outcomes, and also the impact on reimbursement by third parties.

BACKGROUND AND RATIONALE: The Committee cited the IOM Report (IOM, Health Professions Education, 2003) and noted the trends in health professions education and training that relate to the development and use of core competencies and the relevance of incorporating these core competencies into health professions training programs to enhance patient outcomes. The Committee expressed the view that the implementation of interdisciplinary training programs that incorporate the IOM core competencies and a rural learning experience would positively impact rural health care delivery and patient outcomes. Further, the Committee encouraged the expansion of interdisciplinary training as a key component of health professions training programs, particularly as a component of Title VII and Title VIII training programs.

- **Implement Demonstration Projects to Develop Best Practice Training Models of Interdisciplinary Teams of Professionals and Paraprofessionals**

The ACICBL recommends that HRSA and BHPPr shall allocate funds to implement demonstration projects to develop evidence-based, best practice training models that reflect competency-based, integrated-interdisciplinary teams of health professionals and paraprofessionals, including community health workers, patient navigators, and promotoras for health care delivery to rural and urban underserved populations. Further, the Committee recommends the development and support of demonstration projects to evaluate the effectiveness of patient navigators in improving outcomes as members of interdisciplinary practice teams serving rural populations at risk for health disparities.

BACKGROUND AND RATIONALE: To best prepare health professionals to meet the needs of an increasingly diverse population and a growing number of patients with chronic health problems, our Nation's health professions education needs to move toward inter-professional models of care. Despite the formative call for strengthening our Nation's health professions education (IOM, Health Professions Education, 2003) by addressing core competencies, our

educational institutions continue to require sufficient incentives and resources to move toward the vision that promotes competencies in (1) patient-centered care, (2) interdisciplinary teams, (3) evidenced-based practices, (4) quality improvement, and (5) informatics. The Federal training programs funded through Title VII and Title VIII are uniquely positioned to facilitate this transformation.

The goal of establishing best practices or models for infusing inter-professionalism into health professions curricula is a complex challenge. Institutes of higher education are typically siloed by discipline, with associated professional credentialing/licensing mechanisms heavily influencing the content of health profession education. Educational institutions often lack sufficient flexibility to easily create an infrastructure that supports cross-discipline courses. Interdisciplinary team taught courses further challenge traditional mechanisms that often only recognize a single instruction of record with associated “weighted student credit” hours going to individual departments. Moreover, even when faculty are interested in collaborative programs, degree programs often lack the flexibility to add an additional “required” course or lack adequate space in the schedules to enable elective training opportunities.

Community-based, inter-professional training opportunities provide an alternative, complementary venue for infusing health professions education with inter-professionalism. The involvement of the community in the development of training objectives enhances the degree to which training best prepares professionals for community practice. Community-based training experiences that occur in clinical settings provide opportunities for health professional students to observe interactions between professions and practice negotiating professional boundaries through effective communication.

Possible strategies related to this recommendation were discussed:

1. Allocate a percentage of Title VII and Title VIII training funds to support the development of best practices for creating shared curricula across health professional education programs that introduce inter-professionalism.
2. Promote inter-professionalism and information sharing across existing grantees and programs that involve or require the participation of two or more disciplines, programs such as AHECs, GECs, Primary Care Training in Medicine and Dentistry programs, Graduate Psychology Education programs and other programs.
3. Allocate a specific amount of funds to existing programs or new programs specifically targeted toward interdisciplinary, community-based rural training grants with the goal of improving access and quality of care in rural communities. Existing programs would include the GEC and the AHEC Programs. A new program could be the former Quentin N. Burdick Rural Interdisciplinary Training Program.
4. Maintain support for inter-professional, community-based training through AHECs and inter-professional training programs with an emphasis on Geriatrics and programs exemplified by GECs.
5. Establish “funding priorities” and add “special consideration” language in the legislation or in existing health professions training program applications to increase and/or strengthen the attention to interdisciplinary education.
6. Leverage the medical home team movement and create a grant program/funding initiative to develop inter-professional curriculum that supports the training of health care teams, stretching to include allied health, mental health, a range of primary health care providers, and families.

7. Consider supporting projects that are highly relevant to rural communities, model a team approach, and focus on sustainability with regard to each of these possible strategies.

<p style="text-align: center;">RECOMMENDATIONS TO THE SECRETARY AND THE CONGRESS – LEGISLATIVE CHANGES</p>

- **Health Care Financing and Health Care Reform: Reimbursement for Team Care**

In an environment in which a variety of strategies are proposed with regard to health care reform and potential changes to the existing health care delivery system and reimbursement methods, the ACICBL recommends that the Secretary support and the Congress authorize the payment of health care delivered by interdisciplinary teams in a manner that assures reimbursement across all member disciplines involved in that team’s clinical services. To enhance the development of the future healthcare team-based workforce, the ACICBL recommends that changes should be made in the current allocation of GME funds so these dollars may be used in the future to support inter-professional graduate education, training, and services for all health professions being educated and trained in both hospital and community-based healthcare settings.

BACKGROUND AND RATIONALE: Third-party reimbursement methods are critical to the make-up of health care delivery systems and the manner in which health care is delivered. Health professions training programs are influenced by third-party payment systems, e.g., insurance companies, health maintenance organizations, fee-for-service plans, Medicare, Medicaid. For example, Title VII training programs with clinical training components are organized in settings that allow for third-party reimbursement and thereby contribute to the cost of training in clinical settings; however, third-party reimbursement is focused on reimbursement of health care delivered by individual disciplines. Given that third-party reimbursement methods are not within the purview of Title VII, efforts should be made to change existing health care financing mechanisms and third-party reimbursement structures, both of which do not support an interdisciplinary team training or delivery approach.

- **Cross-Training of Allied Health Disciplines**

The ACICBL recommends that the Secretary support and the Congress authorize and fund grants to expand cross-training, credentialing opportunities, and core competencies across targeted allied health disciplines, to include, but not be limited to: medical assistants, pharmacy assistants, radiology technologists/technicians, laboratory assistants, and respiratory therapists. This expansion for pre-baccalaureate allied health occupations in rural health systems would positively impact personnel resources without significantly increasing employer costs.

BACKGROUND AND RATIONALE: Cross-training is defined as receiving education and training to expand the individual’s practice into another area, utilizing already earned academic credit for core courses or by training for individual tasks, as compared to earning the entire credential.

Cross-credentialing is defined as becoming proficient in a number of different skills, i.e., holding skills and/or credentials from one or more health occupation.

Because there are fewer patients in sparsely populated rural communities, it is financially difficult to hire and retain multiple allied health personnel. Lower volume in rural hospitals and primary care

clinics makes it financially difficult to hire and retain separate individuals with skills from each allied health occupation, and these personnel currently are under-utilized when they are employed. This is evidenced in a report on Washington State Rural Health Clinics (RHC), (Washington State Department of Health, 2002). In this report of 120 RHCs, 20 to 30 percent of diagnostic tests, screenings, x-ray procedures, and laboratory work had to be referred out due to a lack of personnel and equipment. Personnel for these services represented between one and four percent of the total personnel in all RHCs. Access to pharmacy services continues to be an issue in rural communities in that the report confirmed that only seven percent of RHCs in Washington State had in-house pharmacy services. Additionally, 59 percent of all the clinics indicated that their patients had communicated difficulties in getting their prescriptions, noting both access and cost considerations.

Lack of personnel issues will increase as rural federally qualified health centers (FQHCs) continue to expand. In a report by the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) Rural Health Research Center (Andrilla et al, 2004), which had a 97 percent response rate from RHCs, 71 to 81 percent of the centers plan to increase either services or locations. The authors indicated there is no national plan to expand the number of health personnel produced by the current education and training systems.

- **Training and Reimbursement for Pharmacological and Psychopharmacological Services**

The ACICBL recommends that the Secretary support and the Congress authorize and fund education and training programs for nurse practitioners, clinical pharmacists, psychologists, and physician assistants to develop their clinical and practice competencies to provide pharmacological and/or psychopharmacological services in order to decrease prescriber workforce shortages and augment access to care for underserved populations. Further, the Committee recommends that the Secretary support and the Congress authorize legislation to assure health care reimbursement (including Medicare, Medicaid, and private health care reimbursement mechanisms) for pharmacological and/or psychopharmacological services offered by these providers.

BACKGROUND AND RATIONALE: The Association of Academic Health Centers (AAHC) recently made a series of recommendations highlighting the fact that the health care workforce must be made a key domestic policy issue (AAHC, 2008). The report notes that unless we address patient access to all health professions and their services and focus on facilitating the education of that workforce, there will be serious consequences in the years ahead. Further, the AAHC joins others in recognizing the need for, and encouraging, the health care professions to educate those interested in rural practice. HRSA's Office of Rural Health Policy (ORHP) recognizes the shortage of health care providers in rural settings and, for example, sponsors two projects designed to improve access to health care services in rural areas. The National Rural Recruitment and Retention Network works to increase the number of providers practicing in rural America, while the Program for All-inclusive Care for the Elderly focuses on determining the level of interest among rural communities for preventive, acute, primary, and long-term care services for the aging population (USDHHS ORHP, 2006). In the area of mental health services alone, Robiner (2006) reports that there are provider shortages in both rural and inner-city locations nationwide. Collier (2008) utilizes Bureau of Labor statistics to illustrate predicted shortages across many health care provider categories by 2014. In a report prepared at the Sheps Center for Health Services Research at the University of North Carolina, Morrisey, Thomas, Ellis, and Konrad (2007) note that “nearly every county in the United States has unmet needs for prescribers (and therefore some level of unmet need overall)”. They present data suggesting that 96.2 percent of counties need additional prescribers across those health care disciplines able to provide those services. Byne (2008) offers a State-by-State listing of the

prescribing practices and regulatory information regarding the practice of nurse practitioners, noting nurse practitioners practice independently when State law permits.

The American Academy of Physician Assistants (AAPA) provides a summary of regulations across all States and the District of Columbia detailing the availability and role of physician assistants in prescribing medications (AAPA, 2008). The Department of Defense has trained psychologists to prescribe within their health care roles in the military (Newman, Phelps, Sammons, Dunivin & Cullen, 2000). As such, the military, United States Public Health Service, and the States of New Mexico and Louisiana have granted prescriptive authority to appropriately trained doctoral-level psychologists. Based on the model curriculum leading to prescriptive authority approved by the American Psychological Association, a number of programs provide postdoctoral education and training in psychopharmacology to currently licensed psychologists. State psychological associations are seeking legal recognition of prescriptive authority for those similarly trained (Munsey, 2008).

Recently, the Pharmacist Services Technical Advisory Coalition obtained recognized current procedural terminology (CPT) codes for medication therapy management services (MTMS). These MTMS procedures reimburse pharmacists for face-to-face patient care assessment and intervention as appropriate, and extend patient access to these providers (Pharmacist Services Technical Advisory Coalition, 2008). These health professions (nurse practitioner, pharmacists, psychologists, and physician assistants) have been legally recognized for an expanded scope of practice to prescribe medications based upon their clinical competencies and practice regulations. With increased funding for education and training and explicit regulatory support for reimbursement for such services, the health care workforce can be expanded and pharmacological and psychopharmacological services can be provided to a wider range of underserved patients and their families.

The ACICBL suggested that the specific recommended legislative changes could be accomplished by including a new section within the reauthorization of Title VII and Title VIII, and by drafting new legislation associated with third-party reimbursement programs, e.g., Medicare, Medicaid.

CHAPTER 4.

CONCLUSIONS

The deliberations and review of available data by the Committee led to the central conclusion that Title VII interdisciplinary, community-based training grant programs should be considered as a significant strategy to improve the health outcomes of rural Americans. The interdisciplinary, community-based training and linkages these programs provide are most urgently needed in rural areas. These grants are integral to the Nation's health care safety net through activities that 1) train a range of health professions students and medical residents in interdisciplinary, rural, and underserved sites; 2) establish key links between the academic health institutions, federally qualified health centers (FQHCs), and rural communities; 3) deliver continuing education to rural providers to maintain and enhance the quality of care in rural communities; and 4) recruit young rural students into health careers.

The Committee believes Title VII programs must remain committed to improving access to quality care for rural populations and increasing the number of health care professionals serving rural communities. These programs have the potential to help solve the current mal-distribution of health care workers by educating and training future practitioners to care for rural and underserved populations. These grants are uniquely positioned to:

- increase the number of health professionals trained to provide health care services in interdisciplinary and multidisciplinary, rural-based settings;
- increase the quality, efficiency, and diversity of these professionals;
- increase the recruitment and retention of health care practitioners in rural areas and make rural practice a more attractive choice for health care practitioners;
- improve the health status of rural citizens by ensuring their access to health care professionals who are technically well-trained, culturally competent, responsive to their needs, and comfortable providing care as part of an interdisciplinary team;
- increase health careers awareness among students living in rural and underserved areas;
- enhance the relevant research capacity focused on health care issues in rural areas; and
- demonstrate and evaluate innovative interdisciplinary methods and models designed to provide access to cost-effective, comprehensive health care.

The Committee further finds a substantial need for interdisciplinary, culturally competent health professionals serving in rural areas, which will increase over time (particularly with the recent expansion of FQHCs). According to U.S. Census Bureau projections, minority groups in rural areas are projected to account for 46 percent of the total population by 2050. The out-migration of younger residents from rural communities, coupled with the disproportionate number of older residents in rural versus urban/metropolitan areas translates into the higher demand for ongoing, coordinated chronic illness care. The expanded demand for services requires a comparable expansion in the education and training system for practitioners to serve these communities. The consequences of not investing in the education and training of rural providers will be dire, resulting in increased health disparities and associated costs in caring for the Nation's vulnerable populations.

Lastly, the Committee encourages an integrated approach to health care delivery and training health professions. Title VII training grant programs should facilitate collaborations between medical

providers and associated health professionals, including behavioral and mental health practitioners to encourage collaborative training practices that incorporate interdisciplinary, coordinated care.

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APPENDIX A

BIOGRAPHICAL NOTES – AUTHORS OF CONCEPT PAPERS

L. Gary Hart, PhD

Director & Endowed Professor, Rural Health Office

Mel & Enid Zuckerman College of Public Health, University of Arizona

Dr. Hart is the Director of the Rural Health Office and Professor in the Mel and Enid Zuckerman College of Public Health at the University of Arizona in Tucson.

For nearly two decades, Dr. Hart served as Director of the University of Washington Rural Health Research Center and the Center for Health Workforce Studies, and as a Professor in the School of Medicine at the University of Washington. Dr. Hart received his doctoral degree in medical geography with a minor in health services research in 1985 from the University of Washington. In addition, he was an adjunct professor in the Departments of Health Service and Geography.

Dr. Hart has published widely on a broad variety of topics, including various aspects of rural health care, health workforce, clinical practice variation, geographic definition methodology, health outcomes, policy analysis, program evaluation, and perinatal care issues at the national, regional, State, and local scales. In 1995, he received the National Rural Health Association's Distinguished Researcher Award. He is an author of more than 160 articles in such journals as the *Journal of the American Medical Association*, *Health Services Research*, *Health Affairs*, and the *American Journal of Public Health*. He is a coeditor of a McGraw-Hill book entitled *Rural Medicine*.

Dr. Hart is currently involved in a broad range of workforce, rural research, and policy analysis projects on topics such as international medical graduates, dental hygienists, and RNs; use of guideline behaviors in hospitals for acute myocardial infarction frontier definition development; and an evaluation of six online RN to BSN programs. He is one of the creators and updaters of the Rural-Urban Commuting Area geographic taxonomy that is being used widely to determine program eligibility and research. He is a United States delegate to the 2008 International Medical Workforce conference in Edinburgh.

Patricia Moulton, PhD

Assistant Professor and Research Analyst, Center for Rural Health

University of North Dakota School of Medicine and Health Sciences

Dr. Patricia Moulton is Assistant Professor at the Center for Rural Health at the University of North Dakota (UND) School of Medicine and Health Sciences, in Grand Forks, North Dakota. In her position, which she has held since June 2002, Dr. Moulton serves as principal investigator on numerous projects. Dr. Moulton was principal investigator on a grant examining the prevalence of chronic disease in American Indian and Alaskan Native elders funded by the U.S. Department of Health and Human Services, Health Resources and Services Administration's Office of Rural Health Policy. This study examined the relationship between chronic disease and functional limitation, access to health care, health damaging behaviors, geographical location, gender, age, and unmet

health needs using the Native Elder dataset, a large nationwide database collected by the National Resource Center on Native American Aging. Dr. Moulton received her doctorate in experimental psychology from the University of North Dakota in 2002.

Mary K. Wakefield, Ph.D., R.N., F.A.A.N.

*Associate Dean for Rural Health and Director for Center for Rural Health
School of Medicine and Health Sciences, University of North Dakota*

Dr. Wakefield is Associate Dean for Rural Health, and Director of the Center for Rural Health at the School of Medicine and Health Sciences, University of North Dakota, in Grand Forks, North Dakota. Dr. Wakefield has held administrative and legislative staff positions in the United States Senate. Currently, she serves on many public and private health-related advisory boards including: Academy Health Board of Directors, Department of Veteran's Affairs' Special Medical Advisory Group, member of Commonwealth Fund Commission on a High Performance Health System; member of the Health Care Services Board for the Institute of Medicine. Locally, Dr. Wakefield serves as a member on the Board of Directors at the North Dakota Health Care Review (Quality Improvement Organization) and the Blue Cross Blue Shield of North Dakota Board of Directors. Dr. Wakefield has also served as a member of the Medicare Payment Advisory Commission, which is responsible for advising the United States Congress on the Medicare program; chair of the Institute of Medicine (IOM) Committee on Health Care Quality for Rural America; and chair of the Catholic Health Initiatives Board of Trustees. She was Commissioner and Subcommittee Chair for President Clinton's Advisory Commission on Consumer Protection and Quality in the Health Care Industry.

Dr. Wakefield has presented nationally and internationally on public policy and strategies to influence the policymaking and political process. She has received numerous awards and recognition for her work in nursing, rural health, and public policy. She is a recipient of the American Organization of Nurse Executives (AONE) 2006 Nurse Research Award and elected to membership in the Institute of Medicine in 2004. She has authored many articles and columns on health policy and is on the editorial board of a number of professional journals, including the Journal of Rural Health, Nursing Economics, and Annals of Family Medicine.

Dr. Wakefield received the B.S. in nursing from the University of Mary in Bismarck, North Dakota, and M.S. and Ph.D. from the University of Texas at Austin. She is a fellow in the American Academy of Nursing.

APPENDIX B

BIOGRAPHICAL NOTES: EXPERTS PROVIDING GUIDANCE TO SHAPE THE REPORT

Claudia R. Baquet, MD, MPH

Associate Dean for Policy and Planning,

Professor of Medicine and Professor Epidemiology and Preventive Medicine,

Director of Center for Health Disparities, University of Maryland School of Medicine University of Maryland Baltimore (UMB)

Former Deputy Assistant Secretary, HHS 1992-1994 (Minority Health)

Former Associate Director for Cancer Control Science & Chief Special Populations Research Branch National Cancer Institute 1984-1992

As Associate Dean for Policy and Planning, Dr. Claudia R. Baquet serves as an advocate for quality health care, including issues related to the health needs and models for underserved communities, telemedicine and rural health initiatives. Dr. Baquet also serves as director of the Maryland Area Health Education Center Program and Director of the UMB Center for Health Policy/Health Services Research. In 2003, she became director of the University of Maryland Comprehensive Center for Health Disparities Research, Training and Outreach. She seeks to reduce and eventually eliminate health disparities.

In 2002, Dr. Baquet served as the chair of the Governor's Commission for the Prevention of Infant Mortality and received the Governor's Citation for the reduction of the Maryland infant mortality rate. She was also formally recognized by the Maryland Senate for her work to reduce cancer disparities and most recently for her longstanding commitment to the community. In 2004, she received the U.S. Department of Health and Human Services "National Best Practice Award" for increasing availability and participation of rural communities in cancer clinical trials. Dr. Baquet's recent awards include NIH's Dr. Martin Luther King, Jr. Special Award for "Closing the Health Gap in the Communities We Serve", the American Public Health Association's 2005 David P. Rall Award for Science and Advocacy in Public Health and the National Medical Association's Council on Concerns for Women Physicians Research Award. In May of 2006, Dr. Baquet received the "Racial Justice Award" from the YWCA of the Greater Baltimore Area. In November 2006, she received the Congressional Recognition Award from the U.S. Congress' Congressman Steny Hoyer, House Majority Leader, for her work in health disparities research and community engagement. In April 2008, she received the Prevent Cancer Foundation's prestigious Laurel Award.

Dr. Baquet's research interests include: cancer disparities and intervention research for underserved and rural communities; strategies for increasing access and participation of diverse communities in clinical trials; policy research on assuring equity in quality health care; and reimbursement for clinical trials coverage. She brings over \$7 million in annual grant funding to the UMB.

Dr. Baquet received her MD in 1977 from Meharry Medical College and her MPH in epidemiology in 1983 from Johns Hopkins University, School of Hygiene and Public Health. Her residency was in

pathology at St. Louis University and Wadsworth Veterans Administration Hospital. She is committed to mentoring students and health professionals in health disparities research and careers in public health.

Michael S. Barr, MD, MBA, FACP

*Vice President, Practice Advocacy and Improvement
American College of Physicians (ACP)*

Michael S. Barr is Vice President, Practice Advocacy and Improvement for the American College of Physicians. Dr. Barr's focus is on public policy relating to the patient-centered medical home, quality improvement, practice redesign, and health information technology. He has overall responsibility for the College's Center for Practice Improvement and Innovation, Regulatory and Insurer Affairs Department, and Medical Laboratory Evaluation Program.

Prior to joining the ACP staff in February 2005, Dr. Barr served as the Chief Medical Officer for Baltimore Medical System, Inc. (BMS), a Joint Commission accredited, multi-site federally-qualified community health center from 1999 - 2005. He was on faculty in the Division of General Internal Medicine at Vanderbilt University from 1993 - 1998 and also served as Physician Director, Medical Management Programs for the Vanderbilt Medical Group. He served in the United States Air Force from 1989 - 1993 at Moody Air Force Base, Georgia.

Dr. Barr completed his residency in Internal Medicine at Rush-Presbyterian-St. Luke's Medical Center in Chicago, Illinois. He is a graduate of New York University School of Medicine, the Vanderbilt Owen Graduate School of Management, and the State University of New York, College of Environmental Science and Forestry. Dr. Barr continues to see patients part-time at the George Washington University Medical Faculty Associates urgent care clinic and holds part-time faculty appointments at Johns Hopkins University and George Washington University.

Daniel S. Blumenthal, MD, MPH

*Professor and Chair of the Department of Community Health and Preventive Medicine
Emory University School of Medicine*

Daniel S. Blumenthal is a graduate of Oberlin College and the University of Chicago School Of Medicine. He completed his residency in pediatrics at Charity Hospital of New Orleans (Tulane Division) and received his master of public health degree from Emory University. He is board-certified in both pediatrics and preventive medicine.

He has served as a VISTA Volunteer physician in Lee County, Arkansas; as an Epidemic Intelligence Service Officer with the Centers for Disease Control in Atlanta; and as a medical epidemiologist with the World Health Organization Smallpox Eradication Program in India and Somalia. While at CDC, he served in the Nutrition Program and the Parasitic Diseases Branch.

From 1975 to 1980, he was an Assistant Professor in the Department of Community Health at the Emory University School of Medicine, where he served as the Medical Director of a neighborhood health center. In 1980, he joined the faculty of the Morehouse School of Medicine, and in 1985 was

appointed to his current position as Professor and Chair of the Department of Community Health and Preventive Medicine. He added the role of Associate Dean for Community Programs in 1993. From 1992 to 1993, while on sabbatical from Morehouse, he served as a consultant to the World Health Organization in Geneva. In 2000, he spent six months as a scholar-in-residence at the Association of American Medical Colleges in Washington, DC.

His publications deal with nutrition, parasitic disease, health policy, environmental health, and cancer prevention. He served as President of the Association of Teachers of Preventive Medicine from 1992 to 1993. He was Chairman of the Medical Care Section (1991 to 1993) and a member of the Governing Council (1993 to 1995) of the American Public Health Association.

In 1994, the Georgia Public Health Association honored him with the Sellers-McCroan Award for outstanding achievement and service in public health. In 1995, in ceremonies marking the 30th anniversary of VISTA, he was named the outstanding VISTA volunteer of the 1960s. In 2002, he received a "Shining Light" Award from the Georgia Association for Primary Health Care. In 2005, he received the Leonard Tow Humanism in Medicine Award from Morehouse School of Medicine.

Marcia K. Brand, Ph.D.

*Associate Administrator, Bureau for Health Professions
Health Resources and Services Administration (HRSA)*

Marcia K. Brand, Ph.D., is the Associate Administrator for the Bureau of Health Professions in the U.S. Department of Health and Human Services' Health Resources and Services Administration (HRSA). HRSA works to fill in the health care gaps for people who live outside the economic and medical mainstream. The agency uses its \$7 billion annual budget (FY 2008) to expand access to quality health care through an array of grants to State and local governments, health care providers, and health professions training programs.

From 2001 to 2007, Dr. Brand was Director and Associate Administrator of HRSA's Office of Rural Health Policy (ORHP). In that position she was responsible for health policy, research, and grant activities promoting better health care services in rural America. On July 9, 2007, Dr. Brand became Associate Administrator of the Bureau of Health Professions (BHP), while continuing in her leadership position at ORHP. On January 31, 2008, she relinquished her ORHP position and retained her position as BHP's Associate Administrator. At BHP, she provides national leadership in the development, distribution, and retention of a diverse, culturally competent health workforce that provides high-quality care for all Americans.

Prior to joining ORHP, Dr. Brand led efforts to plan and implement the State Planning Grant Program, which helped States explore options in providing health care coverage for their uninsured residents. She also coordinated HRSA's efforts to implement the State Children's Health Insurance Program (SCHIP) and worked on the Secretary's Initiative on Children's Health and the President's Interagency Task Force on Children's Health Insurance Outreach, which aimed to increase enrollment in SCHIP and Medicaid.

As Senior Advisor to the Deputy Assistant Secretary for Health in 1997, Dr. Brand worked on the Secretary's Initiative on the Future of Academic Health Centers. She served as Deputy Director of BHP's Office of Research and Planning for two years prior to that appointment. She earned a

doctoral degree in higher education from the University of Pennsylvania, and Master and Bachelor of Science degrees in dental hygiene from Old Dominion University in Virginia.

Erin P. Fraher, MPH

Director of the North Carolina Health Professions Data System (HPDS)

Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill

Ms. Erin Fraher received a Bachelor of Arts from Wellesley College in 1988 and a Masters of Public Policy from the University of California at Berkeley in 1993. She is currently a Ph.D. student in the Department of Health Policy and Administration at the University of North Carolina (UNC) at Chapel Hill and expects to graduate by December 2008. Her dissertation examines physician career trajectories in rural communities in North Carolina between 1980 and 2006.

Ms. Fraher is the Director of the North Carolina Health Professions Data System (HPDS) at the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill. The HPDS is a research program that generates timely, objective and data-driven analyses to inform health workforce policy debates in the State. In this capacity, Ms. Fraher has undertaken numerous analyses that have shaped the direction of health workforce policy discussions. For example, her research has examined whether North Carolina has an adequate supply of psychiatrists. She provided analyses and testimony on legislative proposals to increase enrollment at UNC-CH's dental school and create a new dental school at East Carolina University. She has worked in partnership with the North Carolina Area Health Education Centers (AHEC) program and the North Carolina Institute of Medicine on analyses of the emerging physician shortage. Ms. Fraher has also been the principal investigator (PI) on research aimed at quantifying the supply of, and need for, allied health professionals in North Carolina. This research focus has led to numerous publications, including fact sheets, white papers, and peer-reviewed publications. Ms. Fraher has worked to engage policy makers in the legislature, the Department of Commerce, the Governor's office, the Department of Health and Human Services, the UNC system, the North Carolina Community College System, and other State agencies in a discussion about the implications of the findings from her allied workforce studies on the future direction of North Carolina's workforce development system. For a complete list of HPDS publications and presentations led by Ms. Fraher see www.shepscenter.unc.edu/hp.

Dr. John H. V. Gilbert

Principal and Professor Emeritus

College of Health Disciplines, University of British Columbia (UBC)

Dr. John Gilbert is Principal and Professor Emeritus at the College of Health Disciplines, University of British Columbia. Throughout his long career, he has served on many national and international boards and committees. His many honors include a Fulbright Scholarship; a David Ross Research Fellowship; a Medical Research Council Post-Doctoral Scholarship; the Outstanding Alumnus Award of the School of Liberal Arts from Purdue University; a Killam Outstanding Teaching Award; a 50th Jubilee Medal from the Faculty of Medicine; and The Distinguished Service Award of the British Columbia Institute of Technology. He is immediate Past President, International Association for Interprofessional Education and Collaborative Practice, and Faculty Advisor, National Health Sciences Student's Association of Canada.

Dr. Gilbert is a member of the Boards of the Michener Institute in Toronto, the British Columbia Health Education Foundation, and the Board of the Women's Health Research Institute. He is Project Lead at the Canadian Interprofessional Health Collaborative, funded by Health Canada. He serves on Health Canada's Health Education Policy Taskforce and is Co-Chair of the WHO Study Group on Interprofessional Education and Collaborative Practice. He is a member of the Editorial Boards of the Journal of Interprofessional Care, and the online Journal of Research in Interprofessional Education. Dr. Gilbert is a consultant in health education policy.

Dennis F. Mohatt, MA

Vice President for Behavioral Health

Western Interstate Commission for Higher Education (WICHE)

Dennis Mohatt is Vice President for Behavioral Health for the Western Interstate Commission for Higher Education (WICHE) and directs its mental health program. Founded in 1955, the WICHE Mental Health Program is a collaborative venture with 15 western States. The program's mission is two fold: 1) to assist the States in the improvement of systems of care for persons with mental illness and their families; and 2) to advance the preparation of a qualified mental health workforce in the West.

He served as Deputy Director for the Nebraska Department of Health and Human Services from 1996 to 1999. In that position, he was designated the State's Commissioner of Mental Health and also provided leadership in the areas of public assistance, rural health, primary care, disabilities, and child welfare. Mr. Mohatt was also responsible for the administration of Nebraska's public managed care initiatives in Medicaid for both physical and behavioral health. He has over a decade of experience in community mental health. He provided executive leadership to a very successful CMHC in Michigan's rural Upper Peninsula to include the successful integration of community mental health services with primary care in two rural family medicine practices. He served on the National Rural Health Advisory Committee to the United States Secretary of Health and Human Services from 1994 to 1998. Recently, Mr. Mohatt served as the Chief Consultant to the Rural Issues Subcommittee of the President's New Freedom Commission on Mental Health and lead author of the subcommittee report to the Commission.

Mr. Mohatt received his undergraduate training at the University of Oregon and an NIMH Training Fellowship in rural mental health while at Mansfield University in Pennsylvania, where he received his Master of Arts degree in rural community-clinical psychology. He has been a member of the Board of Directors for the National Association for Rural Mental Health since 1987 and was the association's President from 1992 to 1995. In 1996, he was awarded the Victor I. Howery Award for outstanding contributions to rural mental health. In July 1993, he was featured as one of "Five Healthcare Heroes" in a feature article in *Omni Magazine*. In 2000, Mr. Mohatt was named Outstanding Young Alumnus by Mansfield University. Recently, he has been a keynote speaker at several regional meetings focused on the integration of behavioral health and primary care, sponsored by the Health Resources and Services Administration (HRSA).

Mr. Mohatt was born and raised in the small farming community of Vail, Iowa. He has lived and worked in several areas of the United States including Arizona, Michigan, Wisconsin, Nebraska, Oregon, and Colorado. His experience has included considerable exposure to cultural diversity, especially in working in partnership with Native American people. Mr. Mohatt is married and has

one young daughter. He is an Alpine Patroller in the National Ski Patrol and a member of several professional organizations.

Wayne Myers, MD

*Trustee and Chair for Committee on Care and Quality
Appalachian Regional Healthcare*

Dr. Myers is a retired rural pediatrician and manager of rural health professions education programs in Alaska, Montana, Idaho, Washington, and Kentucky. He helped plan the shift from territorial to in-state health care in Alaska, managed technical assistance programs for rural hospitals from 1986 to 1997, and currently chairs the Rural Health Work Group for the Governor's Office in Maine. He directed the Federal Office of Rural Health Policy from 1998 through 2000, and was President of the National Rural Health Association in 2003. He is currently a Trustee of Appalachian Regional Healthcare (ARH), a non-profit system operating hospitals, clinics and home health agencies in eastern Kentucky and West Virginia. Dr. Myers chairs ARH's Committee on Care and Quality and writes quarterly columns for *The Rural Monitor*. He and his wife, JoAnn, operate Beau Chemin Organic Preservation Farm in Waldoboro, Maine.

Dena S. Puskin, Sc.D.

*Director, Federal Office for the Advancement of Telehealth
Chair, Joint Working Group on Telemedicine*

Dr. Puskin is the Director of the Federal Office for the Advancement of Telehealth. She also chairs the Joint Working Group on Telemedicine, a staff-level interagency committee focused on advancing the development of cost-effective telemedicine initiatives across the Federal government.

Prior to her current position, Dr. Puskin served as the Acting Director and Deputy Director of the Federal Office of Rural Health Policy (ORHP). She has assumed many leadership positions within and outside of government. Prior to joining ORHP in 1988, Dr. Puskin was a Senior Analyst at Congress's Prospective Payment Assessment Commission (predecessor to MedPAC), where she developed the model for annual updates of Medicare payment rates to hospitals and worked on numerous economic issues related to rural hospitals and specialty hospitals in the U.S. (psychiatric, rehabilitation, and chronic disease hospitals). From 1982 to 1984, she was employed by the Blue Cross/Blue Shield Association as a Senior Legislative Analyst in Washington D.C. Dr. Puskin served as Research Director at the Finger Lakes Health Systems Agency and as Assistant Professor of Community Medicine at the University of Rochester School of Medicine and Dentistry from 1977 to 1981.

Dr. Puskin received her Sc.D. in Health Policy and Research from Johns Hopkins University; a M.S. in Community Medicine from the University of Rochester, School of Medicine and Dentistry; and B.A. and M.A. degrees in Biology from Boston University.

Linda J. Redford, RN, PhD

*Director of the Geriatric Education Center & Comprehensive Geriatric Education Program
Associate Director of the Center on Aging and Faculty of the School of Nursing
University of Kansas Medical Center*

Dr. Redford is the Director of the Central Plains Geriatric Education Center and the Comprehensive Geriatric Education Program at the University of Kansas Medical Center (KUMC). She is also an Associate Director of the Center on Aging and on the faculty of the School of Nursing at KUMC. Dr. Redford holds a Bachelor's Degree in Nursing, Master's Degrees in Nursing and Medical Anthropology, and a Doctoral Degree in Anthropology from the University of Kansas.

Prior to her current positions, Dr. Redford developed and directed a National Resource and Policy Center on Rural Long-Term Care funded by the Administration on Aging at the Department of Health and Human Services. This Center identified and disseminated information on models for rural community-based long-term care and provided education and information nationally on rural long-term care issues. She has worked as a community health nurse, nurse educator, researcher and administrator. She is a frequent speaker at national meetings on aging and health-related topics, such as functional assessment, care management, and issues in rural long-term care service delivery.

Dr. Redford, a former National Kellogg Fellow, has served as Chair of the National Institute on Community-Based Long-Term Care, a constituent unit of the National Council on the Aging, and on the Boards of Directors of the Mid-America Congress on Aging, the National Council on the Aging, and the American Society on Aging. Dr. Redford is currently the President of the National Association on Geriatric Education and the National Association of Geriatric Education Centers.

Thomas Weida, M.D., F.A.A.F.P.

*Professor, Department of Family and Community Medicine
Medical Director, University Physician Group
Penn State University Hershey College of Medicine*

Thomas Weida, M.D., a family physician in Hershey, Pennsylvania, is Speaker of the Congress of Delegates, the governing body of the American Academy of Family Physicians (AAFP), and serves on the AAFP Board of Directors. The AAFP represents more than 94,000 physicians and medical students nationwide. He is also a Professor in the Department of Family and Community Medicine at Penn State Hershey College of Medicine, Hershey, Pennsylvania and the Medical Director of the University Physician Group affiliated with the Hershey Medical Center.

A member of the AAFP since 1977, Weida has served on numerous commissions and committees that focused on resident and student issues, finance, marketing and public relations, new physicians, insurance and financial services, bylaws, and scientific programs. He has been a delegate or an alternate delegate to the Congress of Delegates from 1988 until 2002. In addition, he served on the editorial board of *Family Practice Management*, the AAFP's practice management journal. He also reviews patient education materials for the Family Health Foundation of America. Dr. Weida has testified on behalf of the AAFP to the Practicing Physician Advisory Council of the Centers for Medicare and Medicaid Services and the House Energy and Commerce Committee Subcommittee on Health. He has served on the board of the AAFP Foundation since 2007.

A member of the Pennsylvania Academy of Family Physicians (PAFP) since 1977, he has served on numerous committees and task forces at the State level. He held the offices of Vice-Speaker and Speaker of the PAFP House of Delegates for a combined seven years; as well as President, President-elect and Vice President. He earned his undergraduate and medical degrees from Lehigh University in Bethlehem, Pennsylvania, and Hahnemann Medical College and Hospital in Philadelphia, Pennsylvania. He completed his family medicine residency at Lancaster General Hospital. Dr. Weida is board certified by the American Board of Family Medicine and is an AAFP Fellow. He has earned a Certificate of Added Qualification in Geriatric Medicine from the American Board of Family Medicine.

Dr. Weida is a member of the Society of Teachers of Family Medicine (STFM) and a fellow of the College of Physicians of Philadelphia. He served on the editorial board of *Pennsylvania Medicine*, affiliated with the Pennsylvania Medical Society. In 1998, *Harrisburg Magazine* listed him among the top doctors in the Harrisburg area. He also has been included in *The Best Doctors in America* database since 2002, published by Best Doctors, Inc. In 1983, he joined a solo medical office in Lititz, Pennsylvania, and during a 13-year period increased the practice to include four physicians and four physician assistants. In 1993, Dr. Weida's practice won the AAFP/STFM Patient Care Award for Patient Education by a Physician.