



Rural Health Research Gateway

Informing Rural Primary Care Workforce Policy: What Does the Evidence Tell Us?

A Review of Rural Health Research Center
Literature, 2000-2010

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ABSTRACT

This literature review profiles 51 publications constituting the body of evidence-based research produced by the federally-funded Rural Health Research Centers (RHRCs) from 2000 to 2010 which is relevant to the rural primary care workforce. The review includes the following sub-sections: [Supply and Demand](#); [Recruitment and Retention](#); [Training Pipeline and Education](#); [Lifestyle and Compensation](#); [Nurse Practitioners, Physician Assistants, & International Medical Graduates](#); and [New Directions for Primary Care](#). Although this review reaffirms a general claim that has been made for at least the last decade and earlier – rural primary care workforce shortages not only exist but continue to worsen, as they result from complex, multifaceted issues which necessitate solutions that are equally complex – it also underscores larger issues driving research:

- Supply and demand research has emphasized the need for uniform, rural-specific primary care workforce data.
- Evidence continues to indicate that targeted, rural-focused recruitment initiatives as well as state and Federal-level policies which provide financial incentives are effective ways to recruit and retain primary care providers in rural areas.
- RHRC research publications focusing on training pipeline and education topics are largely in agreement about the demographics of medical students and primary care providers who are more likely to practice and stay in rural areas as well as the factors which influence these decisions.
- There has been an increasing push to streamline primary care, particularly in rural areas where communities are more commonly required to “do more with less,” and in recent years RHRC research has articulated and analyzed new, alternative models for primary care.
- 2010 saw the passage of the most comprehensive Federal health reform legislation in decades, and RHRC researchers have examined the implications this legislation may have on the rural primary care workforce.

INTRODUCTION

In September 2010, the [Rural Health Research Gateway](#) project sponsored [a web-based seminar](#) focusing on current issues and factors affecting the landscape of primary care health workforce in rural areas. The primary presentation during the seminar was provided by Dr. Mark Doescher, director of the [WWAMI Rural Health Research Center](#) (RHRC), who surveyed current supply and demand issues in rural primary care and addressed ways in which these issues are currently being addressed via Federal policy. Doescher structured his talk around three major sub-categories which have demonstrable effects on the recruitment and retention rates of rural primary care health professionals: the primary care training pipeline, lifestyle issues, and compensation.

This particular analysis is intended to provide a review of the evidence-based research relevant to the rural primary care workforce produced by the federally-funded Rural Health Research Centers (RHRCs) from 2000 to 2010. The review serves as a companion to the seminar and is structured around these primary sub-categories, providing in-depth context for Doescher's discussion, while also profiling research addressing additional relevant sub-categories not mentioned in Doescher's presentation.

Essentially, the evidence which surfaces from a review of RHRC-sponsored research reaffirms claims that have been made for at least the last decade and earlier: rural primary care workforce shortages not only exist but continue to worsen, as they result from complex, multifaceted issues which necessitate solutions that are equally complex.

Doescher provided a grim overview of rural primary care workforce issues, citing recent trends that reveal a sharp drop in the number of graduating medical students specializing in general internal medicine over the past fifteen years. In 1998, approximately 55% of residents specialized in general internal medicine, but in 2005, this proportion dropped to 20%. Similar patterns exist in family medicine: the number of first-year, post-medical-school residency education positions available in family medicine peaked at 3,293 in 1998 but dropped by 20% to 2,630 in 2010. In his presentation, Doescher also cited "estimates of a 30% or greater increase in primary care workload by 2020 paired with a 7% increase in supply at best, which translates to a shortfall of 35,000 to 44,000 primary care providers nationally." Doescher identified additional "alarming trends" for rural health care, including a decrease of ten percentage-points in the proportion of physician assistants going into primary care since 1991 (from over 50% in the late 1990s to 40% in 2005).

Recently, the WWAMI RHRC produced a policy brief (2009)¹ profiling many factors relevant to rural primary care workforce shortages, drawing from a body of evidence described throughout the remainder of this literature review. As a starting point, consider the following evidence from this policy brief:

- *Of the 2,050 rural counties in the U.S., 1,582 (77%) are primary care health professional shortage areas (HPSAs). In 2005, 165 rural counties lacked a primary care physician.*
- *In 2005 there were 55 primary care physicians per 100,000 persons in rural areas compared with 72 in urban areas. This decreases to 36 per 100,000 in isolated small rural areas.*
- *Rural primary care physicians are older than their urban counterparts.*
- *Rural areas rely on non-physician primary care providers (physician assistants [PAs] and nurse practitioners [NPs]). These providers make up 46% of providers at rural, federally-qualified community health centers (CHCs).*
- *In 2004, rural CHCs had significantly higher proportions of unfilled positions and more difficulty recruiting family physicians than urban CHCs; more than one-third of rural CHCs spent over 7 months recruiting a family physician.*

RHRCs have produced numerous publications regarding the rural primary care workforce, many stemming from in-depth, formal research projects. These publications and projects are highlighted below across several subcategories:

- [Supply and Demand](#) literature seeks to quantify the primary care workforce currently in place and/or the primary care workforce needed in rural areas.
- [Recruitment and Retention](#) literature examines strategies for increasing primary care workforce supply.
- [Training Pipeline and Education](#) literature focuses specifically on education and training strategies designed to increase numbers of students choosing rural and primary care practice.
- [Lifestyle and Compensation](#) literature focuses on factors outside of education deemed to have an impact on rural providers' decisions to practice and remain in rural areas and/or primary care.
- [Nurse Practitioners, Physician Assistants, & International Medical Graduates](#) literature examines these specific providers as possible solutions to fill the supply and demand gap in rural areas.
- [New Directions for Primary Care](#) literature examines or proposes ways of changing, streamlining, or re-imagining primary care in order to do "more with less."

¹Doescher, M.P., Skillman, S.M., & Rosenblatt, R.A. (2009). [The Crisis in Rural Primary Care \(Policy Brief\)](#). WWAMI Rural Health Research Center.

SUPPLY & DEMAND

The body of supply and demand literature produced via the RHRC program over the last decade continues to support claims that rural areas are more affected than urban areas by health workforce supply and demand concerns. Specific contributing factors include:

- Trends among medical graduates away from generalist specialties.
- An increasing reliance on international medical graduates, who may be less likely to remain in rural areas long-term.
- A growing proportion of women, who have been historically less likely than men to practice in rural areas, choosing generalist specialties.

Most recently, the WWAMI RHRC studied rural primary care physician supply (2010)², finding that the “the proportion of students choosing family medicine careers will likely remain far below the numbers required to replace rural and urban family physicians leaving the field because of death or retirement,” and identifying a dysfunctional pipeline of rural youth choosing careers in medicine as one of numerous barriers to expanding rural physician supply. This study builds on prior relevant work by the WWAMI RHRC, concluding in each case that demand outpaces supply, sometimes critically so (2009)³, (2008)⁴, (2007)⁵, (2005)⁶, (2003)⁷.

The WWAMI RHRC’s work has also examined specific facets of the rural primary care physician workforce, underscoring larger supply and demand issues within particular contexts. A recent study (2009)⁸ concludes that the aging of the workforce has implications for rural areas, which rely more heavily than urban areas on near-retirement primary care providers. Additional work highlights trends in national physician residency match rates for family medicine and primary care more generally

² Rosenblatt, R.A., Chen, F.M., Lishner, D.M., & Doescher, M.P. (2010). [The Future of Family Medicine and Implications for Rural Primary Care Physician Supply \(Final Report\)](#). WWAMI Rural Health Research Center.

³ Doescher, M.P., Fordyce, M.A., Skillman, S.M., Jackson, J.E., & Rosenblatt, R.A. (2009). [Persistent Primary Care Health Professional Shortage Areas \(HPSAs\) and Health Care Access in Rural America](#) (Policy Brief). WWAMI Rural Health Research Center.

⁴ Fordyce, M.A. (2008). National Changes in Physician Supply (Research Project). WWAMI Rural Health Research Center.

⁵ Fordyce, M.A., Chen, F.M., Doescher, M.P., & Hart, L.G. (2007). [2005 Physician Supply and Distribution in Rural Areas of the United States \(Full Report\)](#). WWAMI Rural Health Research Center.

⁶ Chen, F.M., Fordyce, M.A., Hart, L.G. (2005). [WWAMI Physician Workforce 2005](#) (Working Paper No. 98). WWAMI Rural Health Research Center.

⁷ Larson, E.H., Johnson, K.E., Norris, T.E., Lishner, D.M., Rosenblatt, R.A., & Hart, L.G. (2003). [State of the Health Workforce in Rural America: Profiles and Comparisons](#). WWAMI Rural Health Research Center.

⁸ WWAMI Rural Health Research Center (2009). [The Aging of the Primary Care Physician Workforce: Are Rural Locations Vulnerable? \(Policy Brief\)](#).

(2010)⁹, compares rural practice by physician and nonphysician clinicians (2003)¹⁰, and examines supply and demand issues for elderly Medicare beneficiaries in rural areas (2005)¹¹.

RHRC Research Reveals...

- The proportion of students choosing family medicine careers will likely remain far below the numbers required to replace rural and urban family physicians leaving the field because of death or retirement.
- There is a dysfunctional pipeline of rural youth choosing careers in medicine.
- Rural areas rely more heavily than urban areas on primary care providers who are older and closer to retirement.
- “One-size-fits-all” approaches to physician shortages in rural communities are generally less effective than policies which take unique local factors into account.
- Approaches to recruitment and retention should be coordinated and multifaceted.
- The nature of the relationship between rural/urban location and primary care provider supply is complex and inconsistent.
- Higher primary care physician densities in rural areas correlate with increased quality of care and reduced rates of hospitalization for certain conditions.

In a unique study (2001)¹², WWAMI researchers developed a practice income model for Washington State and found evidence that “a one-size-fits-all approach to physician shortages in rural communities does not make sense.” Rather, “policy must take into account whether the community is ‘demand deficient’ and thus lacks the capacity to support more physicians.”

The Rural Policy Research Institute (RUPRI) RHRC did just this, articulating a method (2002)¹³ designed to “assess the implications of *place* for providing health care services,” and putting this methodology to work in a later study (2007)¹⁴ which identified rural primary care supply in Wyoming as an area of concern. Key findings

⁹Chen, F.M. (2010). [Future of Family Medicine and Implications for Primary Care Physician Supply \(Research Project\)](#). WWAMI Rural Health Research Center.

¹⁰Grumbach, K., Hart, L.G., Mertz, E., Coffman, J., & Palazzo, L. (2003). [Who is Caring for the Underserved? A Comparison of Primary Care Physicians and Nonphysician Clinicians in California and Washington](#). *Annals of Family Medicine*, 1(2), 97-104.

¹¹Hart, L.G. (2005). [Access to Physician Care for the Rural Medicare Elderly](#). WWAMI Rural Health Research Center.

¹²Wright, G.E., Andrilla, H.A., & Hart, L.G. (2001). [How Many Physicians Can a Rural Community Support? A Practice Income Model for Washington State](#). WWAMI Rural Health Research Center.

¹³Shambaugh-Miller, M.D., Stoner, J.A., Pol, L.G., & Mueller, K.J. (2002). [Health Services at Risk in “Vulnerable” Rural Places](#) (Policy Brief). RUPRI Rural Health Research Center.

¹⁴RUPRI Rural Health Research Center (2007). [Status and Future of Health Care Delivery in Rural Wyoming: A Summary Report](#).

emphasized that health workforce demand in the state will be increased by a growing aging population; the authors recommend that Wyoming “establish a coordinated, multifaceted approach” to recruitment and retention.

The North Carolina RHRC conducted an examination (2006)¹⁵ of rural primary care physician supply in the Southeast United States via access rates to outpatient physician services, finding that “low local primary care physician densities are associated with travel inconvenience but not convincingly with other aspects of access to outpatient care,” except for patients insured under Medicaid.

On the other hand, The NORC Walsh Center for Rural Health Analysis found evidence (2004)¹⁶ in a nationwide study (620 counties) that “manpower shortages and limited availability of health care resources may affect the quality of care in rural communities,” but noted dramatic differences between elderly and non-elderly populations. The author concluded that “strengthening primary care capacity could lead to lower rates” of hospitalization for elderly populations, but found only “a small positive relationship between primary care supply and avoidable hospitalization rates” for non-elderly populations. The author emphasized that “the nature of the relationship” between “rural/urban location and primary care provider supply” is “complex and inconsistent.”

In a later study (2005)¹⁷ of the relationship between physician supply and Ambulatory Care Sensitive Condition (ACSC) hospitalization rates across 642 urban counties and 306 rural counties, the South Carolina Rural Health Research Center concluded that increased numbers of primary care physicians *does* correlate with reduced rates of hospitalization for ACSCs. Furthermore, authors claim that “physician supply is positively associated with the overall performance of the primary health care system.”

It should be noted when examining contradictory research findings and/or policy recommendations in the aforementioned publications that these studies all examine different data sets and different proportions of rural-specific data compared to urban data. This should not “explain away” these different findings but rather emphasize the need for uniform, rural-specific workforce data and provide possible avenues for new research.

¹⁵Pathman, D.E., Ricketts, T.C., &Konrad, T.R. (2006). [How Adults' Access to Outpatient Physician Services Relates to the Local Supply of Primary Care Physicians in the Rural Southeast](#). North Carolina Rural Health Research Center.

¹⁶Sutton, J.P. (2004). [Access To Primary Care And Quality Of Care In Rural America](#). NORC Walsh Center for Rural Health Analysis.

¹⁷Laditka, J.N., Laditka, S.B., &Probst, J.C. (2005). [More May Be Better: Evidence of a Negative Relationship Between Physician Supply and Hospitalization for Ambulatory Care Sensitive Conditions](#). *Health Services Research*, 40(4), 1148-1166. .

RECRUITMENT & RETENTION

What factors influence primary care providers to choose to practice and remain in rural areas? Prevalent claims in recruitment and retention literature relevant to rural primary care are summarized in the aforementioned WWAMI policy brief, “Crisis in Rural Primary Care” (2009)¹⁸. Evidence continues to indicate that targeted education and rural-focused recruitment initiatives are effective as well as state and Federal-level policies which provide additional financial incentives to practice and remain in rural areas.

A comprehensive study, “Status and Future of Health Care Delivery in Rural Wyoming,” was produced by the RUPRI RHRC (2007)¹⁹ and examines many facets of rural health care in the state. In terms of workforce recruitment and retention, the authors emphasize the importance of making changes in medical schools (improving efforts to recruit rural-born students, refrain from overlooking older and non-traditional students, and encourage medical students to specialize in family medicine) and

expanding class sizes as well as the existing Regional Education Program in the state to provide students with exposure to rural areas.

RHRC Research Reveals...

- The most effective primary care recruitment strategies include targeting students with rural backgrounds, exposing students to rural areas & issues during medical school, and offering financial incentives to practice and remain in rural areas.
- Older and nontraditional medical students are more likely to practice in rural areas.
- Low salaries, cultural isolation in rural areas, poor-quality schools and housing, and a lack of spousal job opportunities are significant barriers to recruiting rural primary care providers.
- National Health Service Corps opportunities are perceived as effective recruitment tools.

The WWAMI RHRC produced a study (2006)²⁰ which identified “low salaries, cultural isolation, poor-quality schools and housing, and lack of spousal job opportunities” as specific barriers to recruitment at community health centers. Earlier, a WWAMI RHRC

¹⁸ Doescher, M.P., Skillman, S.M., & Rosenblatt, R.A. (2009). [The Crisis in Rural Primary Care \(Policy Brief\)](#). WWAMI Rural Health Research Center.

¹⁹ RUPRI Rural Health Research Center (2007). [Status and Future of Health Care Delivery in Rural Wyoming: A Summary Report](#).

²⁰ Rosenblatt, R.A., Andrilla, H.A., Curtin, T., & Hart, L.G. (2006). [Shortages of Medical Personnel at Community Health Centers: Implications for Planned Expansion](#). *JAMA*, 295(9), 1042-1049.

comprehensive technical report (2004)²¹ surveyed health centers about their perceptions of various ways to improve recruitment and retention rates, finding that salary increases, more National Health Service Corps opportunities, and a portable benefit package were incentives that rural centers perceived as having the greatest likely positive impact on recruitment. WWAMI RHRC researchers also examined gender-related factors related to recruitment and found that “women were more likely than men to have been influenced in making their practice choice by issues related to spouse or personal partner, flexible scheduling, family leave, availability of childcare, and the interpersonal aspects of recruitment” (2002)²².

Medical education and the training pipeline are subjects closely related to health workforce recruitment and retention. However, due to the manner in which education and training research is similarly-focused, these topics are examined independently in the following section.

²¹Andrilla, H.A. & Hart, L.G. (2007). [Health Center Expansion and Recruitment Survey 2004: Results by Health and Human Services Regions and Health Center Geography](#). WWAMI Rural Health Research Center.

²²Ellsburly, K.E., Baldwin, L., Johnson, K.E., Runyan, S.J., & Hart, L.G. (2002). [Gender-Related Factors in the Recruitment of Generalist Physicians to the Rural Northwest](#). *Journal of the American Board of Family Practice*, 15(5), 391-400.

TRAINING PIPELINE & EDUCATION

Most RHRC training and pipeline research products have a broad, national scope and provide large-scale insight by examining data from medical schools across the country. Most recently (2008)²³, the WWAMI RHRC conducted an analysis of medical school graduates spanning nine years, from 1988-1997, concluding that “slight declines in the percentage of recent medical school graduates entering rural practice were found, though the decline was somewhat less than found in an earlier study,” and discovering that “a small number of medical schools and residency programs accounted for the training of the majority of rural physicians,” underscoring the importance and efficacy of rural-focused training programs, rotations, and residencies.

Stemming from a larger research project (2005)²⁴, the WWAMI RHRC produced a chartbook (2005)²⁵ relevant to primary care training, comparing the scope and presence of rural-focused program components, finding that “although over one-third of the urban programs listed rural training as an important part of their mission, only 2.3 percent of the training they supported took place in rural areas.” This chartbook focuses exclusively on these rural training programs, discussing and comparing the characteristics and geographic locations of family medicine residency programs’ rural locations, types of rural family medicine training by location, and the rural mission of family medicine residencies. WWAMI RHRC researchers found through this comparison that “very little family medicine residency training actually takes place in rural areas, largely because very few residencies are located within rural America.”

Building upon these insights, the WWAMI RHRC produced two policy briefs designed to make concrete recommendations to policymakers which may improve the vitality of family medicine workforce pipelines throughout rural America. The first (2009)²⁶ recommends that policies be implemented that support the establishment of “rural longitudinal clinical experiences,” “increase the number of family medicine residency programs located in rural communities” as well as “rural training tracks provided through urban family medicine programs,” and which support “funding mechanisms for ambulatory training, as most rural family medicine clinical practice occurs outside of the hospital setting.” The second (2009)²⁷ focuses more specifically on earlier stages of the training pipeline, encouraging the enactment of policies which lead to more

²³ WWAMI Rural Health Research Center (2008). [The U.S. Rural Physician Workforce: Analysis of Medical School Graduates from 1988-1997](#) (Policy Brief).

²⁴ Hart, L.G. (2005). [Chartbook of Family Practice Graduate Medical Education Programs in Rural America \(Research Project\)](#). WWAMI Rural Health Research Center.

²⁵ Hart, L.G., Lishner, D.M., Larson, E.H., Chen, F.M., Andrilla, H.A., Norris, T.E., Schneeweis, R., et al (2005). [Pathways to Rural Practice: A Chartbook of Family Medicine Residency Training Locations and Characteristics](#). WWAMI Rural Health Research Center.

²⁶ WWAMI Rural Health Research Center (2009). [The Availability of Family Medicine Residency Training in Rural Locations of the United States](#) (Policy Brief).

²⁷ WWAMI Rural Health Research Center (2009). [The Future of Family Medicine and Implications for Rural Primary Care Physicians](#) (Policy Brief).

medical school applicants having rural backgrounds, and also discusses policies aimed at practicing rural physicians, such as providing financial incentives, increased reimbursement rates, tax credits, and malpractice immunity for free care.

Two WWAMI RHRC studies examined niche aspects of the rural primary care training pipeline. In the first (2003)²⁸, researchers examined the ramifications of the 1997 Balanced Budget Act upon family practice training programs, concluding that it “did not have an immediate significant negative impact on family practice residency programs,” but noting “a worrisome increase in the rate of family practice residency closures since

RHRC Research Reveals...

- A small number of medical schools and residency programs train the majority of rural physicians.
- In 2005, over one-third of the urban family medicine programs listed rural training as an important part of their mission, but only 2.3 percent of the training they supported actually took place in rural areas.
- Rural longitudinal clinical experiences and training tracks increase the number of family medicine residency programs located in rural communities.
- It is important to fund ambulatory training, as most rural family medicine clinical practice occurs outside of the hospital setting.
- Policies should be enacted which lead to more medical school applicants having rural backgrounds.
- A few medical schools may serve as models for others that aim to train women who later enter rural practice.

1997” and encouraging policymakers to establish “a mechanism to monitor all primary care program closures to give an early warning should this trend continue.” Earlier (2000)²⁹, the WWAMI RHRC focused on the gender gap in rural family physicians. Building on the knowledge that women physicians are less likely than men to choose rural practice, they found that “a few schools, most of them public, may serve as models for schools that aim to train women who later enter rural practice.”

RHRC publications focusing on this topic are largely in agreement about the demographics of students

and providers who are more likely to practice and stay in rural areas as well as the factors which influence these decisions. In cases when policy recommendations differ, it is a matter of scope (RUPRI, for example, focuses exclusively on Wyoming in their study whereas some of WWAMI’s larger studies have a nation-wide focus) rather than fundamental differences in evidence-based findings.

²⁸Schneeweis, R., Rosenblatt, R.A., Dovey, S., Hart, L.G., Chen, F.M., Casey, S., & Fryer Jr., G.E. (2003). [The Effects of the 1997 Balanced Budget Act on Family Practice Residency Training Programs](#). *Family Medicine*. 35(2): 93-9.

²⁹Ellsbury, K.E., Doescher, M.P., & Hart, L.G. (2000). [U.S. Medical Schools and the Rural Family Physician Gender Gap](#). *Family Medicine*. 32(5):331-337.

LIFESTYLE & COMPENSATION

Like anyone else, primary care providers place certain values on lifestyle factors when considering where to practice, and earning potential is certainly a major part of this.

The NORC Walsh Center for Rural Health Analysis conducted a study (2009)³⁰ of rural physicians' satisfaction levels and decisions to relocate, finding that "while there are a number of characteristics about rural practice associated with high dissatisfaction they are generally not associated with decisions to move from rural practice," compensation being the one exception. Other factors associated with physician dissatisfaction commonly included "access to cultural activities, amount of person time away from work, and access to continuing medical education opportunities." Additionally, the authors found that physicians in rural areas who were younger than 33 were more likely to move to an urban practice than their older counterparts.

This work built on a prior study of rural primary care physician satisfaction conducted by the Minnesota RHRC (2000)³¹, examining the factors influencing physicians who decided to sell their rural practices. The authors found that "the motivations for ceding control to non-local buyers center on managed care concerns, recruitment concerns, and administrative burdens" as well as compensation, but that "the pre-acquisition financial concerns of sellers were not significantly stronger than the financial concerns of practices that remained independent."

The RUPRI RHRC has produced a number of studies focusing specifically on physician compensation. Following changes to Medicare reimbursement policy earlier in the decade, the RUPRI RHRC produced a study relevant to rural primary care providers (2004)³², finding that "the percentage of physicians in both urban and rural areas who are accepting new Medicare patients is declining," due in part to a demonstrable loss in revenue. The authors caution policymakers that "the negative implications of not taking the necessary steps to reverse the small but important decline in physician willingness to take new Medicare patients may be most serious in rural communities."

³⁰Berk, M., Feldman, J., Schur, C., & Gupta, J. (2009). [Satisfaction with Practice and Decision to Relocate: An Examination of Rural Physicians](#). NORC Walsh Center for Rural Health Analysis.

³¹Stensland, J., Brasure, M., & Moscovice, I. (2000). [Why do Rural Primary Care Physicians Sell Their Practices?](#) Working Paper #32, Minnesota Rural Health Research Center.

³²Mueller, K.J., MacKinney, A.C., McBride, T.D., Meza, J.L., & Xu, Liyan (2004). [Rural Physicians' Acceptance of New Medicare Patients](#). RUPRI Rural Health Research Center.

As Medicare reimbursement policies continued to shift, RUPRI built upon their prior work. Authors found in one project (2006)³³ that “one small change in the GPCI [geographic practice cost index] formula generates additional Medicare payment in a significant majority of Medicare payment localities,” but that parts of the Medicare Modernization Act of 2003 were less effective than they were intended to be for many rural practitioners. An additional study (2009)³⁴ examined the impact on rural primary

RHRC Research Reveals...

- Factors associated with physician dissatisfaction commonly include compensation, access to cultural activities, lack of time away from work, and access to continuing medical education opportunities.
- Compensation is the only one of these factors associated with decisions to move from rural practice.
- Physicians in rural areas who were younger than 33 were more likely to move to an urban practice.
- Parts of the Medicare Modernization Act of 2003 were less effective than they were intended to be for many rural practitioners.

care physician payments of the Medicare Physician Fee Schedule update implemented in 2007, intended to benefit rural providers by increasing compensation for cognitive primary care services such as evaluation and management. Based on the assumption that “because few non-primary care proceduralists deliver services in rural areas, rural primary care practices will tend to provide more procedures than urban primary care practices,” the authors made an important analytical distinction

between procedural and cognitive practices, finding that the 2007 update increased cognitive practice earnings in terms of percentages and procedural practice earnings in terms of dollars. The authors note, however, that “additional changes to the Medicare Physician Fee Schedule reduced intended physician compensation increases.”

With the assumption that Medicare practice expense adjustment methodology “warrants careful validation to demonstrate that the index measures actual geographic practice cost differences,” RUPRI studied the effects of Medicare physician payment on rural practice expense (2003)³⁵, finding that “overall Medicare payment reductions and the perception of an unjustified rural / urban payment differential, in combination with a demographically disproportionate elderly population and an often tenuous physician

³³Mueller, K.J., MacKinney, A.C., & McBride, T.D (2006). [Medicare Physician Payment: Impacts of Changes on Rural Physicians](#). RUPRI Rural Health Research Center.

³⁴MacKinney, A.C., Mueller, K.J., & Charlton, M (2009). [Rural Primary Care Physician Payment 2006-2009: What a Difference Three Years Doesn't Make](#). RUPRI Rural Health Research Center.

³⁵MacKinney, A.C., McBride, T.D., Shambaugh-Miller, M.D., & Mueller, K.J. (2003). [Medicare Physician Payment: Practice Expense](#). RUPRI Rural Health Research Center.

supply, may increase the risk that rural Medicare beneficiaries will lose access to health care.”

This analysis led to additional RUPRI work examining rural primary care workforce in terms of compensation factors. A study with a broad focus of physician payment policies (2004)³⁶ provided “an explanation of the physician payment formula with an easy-to-follow schematic” as well as “a database of payments in 89 payment areas.” This work allows RUPRI researchers to simulate the effects of potential policy choices relevant to the current payment formula, testing two specific hypotheses: 1) “modest changes in the calculation of Geographic Practice Cost Indices (GPCIs) will yield significant increases in payment for rural physicians”; and 2) “physician practices affected favorably by increasing the work index used in the Geographic Adjustment Factors (GAFs) will locate in rural areas that include a disproportionate share of shortage areas and serve a disproportionate percentage of elderly persons.”

Overall, the RHRC research relevant to lifestyle and compensation demonstrates that financial, cultural, and economic incentives as have tangible effects on health care providers’ decision to practice and/or remain in rural areas.

³⁶Mueller, K.J. (2004). [Establishing a Fair Payment for Rural Physicians \(Research Project\)](#). RUPRI Rural Health Research Center.

NURSE PRACTITIONERS, PHYSICIAN ASSISTANTS, & INTERNATIONAL MEDICAL GRADUATES

With primary care workforce supply and demand trends increasingly pointing to shortages, health care has increasingly looked to other professions and providers as possible solutions to fill the gap. RHRC research has examined both the viability and efficacy of these efforts.

PA training programs have spread dramatically in recent decades, as the WWAMI RHRC demonstrated in a comprehensive report (2007)³⁷ consisting of a data-based history of the Physician Assistant (PA) workforce which examines evolutionary trends in the profession from 1967 to 2000. According to the authors, “56% of all practicing PAs were trained between 1991 and 2000.” The authors also found that rural participation among PAs “remains high, with more than 18% of PAs practicing in rural settings” in 2000, and that “47% of active PAs” participate in primary care to some degree. The authors state, however, that “whether the historical contribution of PAs to primary care for rural and underserved populations can be sustained in the face of increasing specialization and higher-level academic credentialing is not clear.”

A Maine RHRC initiative (2003)³⁸ sought to examine the “current state of training, licensure, reimbursement, and practice location choices of Advance Practice Registered Nurses” relevant to mental health supply and demand issues. This project resulted in a working paper (2004)³⁹ which advocated financial incentives for Advance Practice Nurses (APNs) choosing rural practice, modifications of state regulations for these practitioners, and increasing rural training opportunities.

International medical graduates serve a vital role in filling rural primary care workforce gaps in many states, according to the WWAMI RHRC (2006)⁴⁰, but this varied greatly from state to state. In 18 states, international medical graduates were more likely than

³⁷Larson, E.H. & Hart, L.G. (2007). [Growth and Change in the Physician Assistant Workforce in the United States, 1967-2000](#). *Journal of Allied Health*. 36:3, 121-130.

³⁸Hartley, D. (2003). [Role of Advanced Practice Registered Nurses in Addressing Mental Health Workforce Shortage \(Research Project\)](#). Maine Rural Health Research Center

³⁹Hartley, D., Hart, V., Hanrahan, N., & Loux, S. (2004). [Are Advanced Practice Psychiatric Nurses a Solution to Rural Mental Health Workforce Shortages?](#) Working Paper #31. Maine Rural Health Research Center.

⁴⁰Thompson, M. J., Hagopian, A., Fordyce, M., & Hart, L. G. (2009). Do international medical graduates (IMGs) “fill the gap” in rural primary care in the United States? A national study. *The Journal of Rural Health*. 25(2), 124-134.

RHRC Research Reveals...

- 47% of active PAs participate in primary care to some degree.
- Rural participation among PAs remains high.
- It is not clear if the historical contribution of PAs to primary care for rural and underserved populations can be sustained.
- International medical graduates serve a vital role in filling rural primary care workforce gaps in many states, but this is not the case in others.
- If all primary care doctors in the J-1 Visa program were to leave, the number of rural counties with no primary care physicians would increase from 161 to 212.

US medical graduates to practice in rural areas, but in 16 states, they were less likely to practice in rural areas. An earlier study by the RUPRI RHRC (2002)⁴¹ examined the role of the J-1 Visa Waiver program within a rural context, finding that “if all primary care doctors in the program were to leave, the number of rural counties with no primary care physicians would go from 161 to 212,” and recommending that this and similar programs be expanded based on collected evidence.

RHRC research indicates that the non-physician primary care workforce as well as International Medical Graduates may indeed serve a vital role in alleviating supply and demand disparities, but that policymakers must work to facilitate this process. There have not yet been evidence-based studies by RHRCs which examine how an increased reliance on NPs, PAs, and IMGs for primary care services might impact overall quality of care.

⁴¹ Mueller, K.J. (2002). [The Immediate and Future Role of the J-1 Visa Waiver Program for Physicians: The Consequences of Change for Rural Health Care Service Delivery](#). RUPRI Rural Health Research Center.

NEW DIRECTIONS FOR PRIMARY CARE

In addition to expanding the scope of practice for non-physicians and looking to international pools for recruitment, there has been an increasing push to streamline primary care, particularly in rural areas where communities are more commonly required to “do more with less.” 2010 saw the passage of the most comprehensive Federal health reform legislation in decades. RHRC researchers have responded accordingly to these shifts, focusing not only on the rural implications of health reform but also suggesting and analyzing new, alternative models for primary care.

In the months and weeks leading up to the passage of the Affordable Care Act (ACA), the Maine Rural Health Research Center engaged in a rapid response project (2010)⁴² designed to inform policymakers with respect to related issues in a rural context, and a health panel composed of experts affiliated with the RUPRI RHRC was convened (2010)⁴³ to provide ongoing, evidence-based assessments of the implications of health reform, culminating in a series of white papers and a report produced immediately following passage of the Act (2010)⁴⁴. Most recently, the Office of Rural Health Policy aggregated all RHRC products relevant to the ACA and published them as a compendium in a single volume (2010)⁴⁵. All products included in this volume relevant to rural primary care workforce issues are profiled independently elsewhere in this literature review.

The Patient-Centered Medical Home (PCMH) model was the subject of four separate RHRC-sponsored studies over the past decade. The North Carolina RHRC initiated a focus on the general concept of care-coordination and team-based care models as a way of alleviating primary care workforce supply and demand burdens in rural areas, producing a working paper (2003a)⁴⁶ which informed a subsequent formal publication (2003b)⁴⁷ on the subject. Examining primary care case management programs

⁴² Hartley, D. (2010). [Health Reform: Rapid Response \(Research Project\)](#). Maine Rural Health Research Center.

⁴³ Dabson, B. (2011). [Health Panel Project: Providing an Objective Assessment of the Implications of Health Reform for Rural People, Places, and Health Care Providers \(Research Project\)](#). RUPRI Rural Health Research Center.

⁴⁴ Mueller, K.J. (2010). [Patient Protection and Affordable Care Act: A Summary of Provisions Important to Rural Health Care Delivery](#). Working Paper #2010-4. RUPRI Rural Health Research Center.

⁴⁵ Van Nostrand, J.F. (Ed.). (2010). [Challenges for Improving Health Care Access in Rural America: A Compendium of Research and Policy Analysis Studies of Rural Health Research and Policy Analysis Centers 2009-2010](#). Washington, D.C.: Office of Rural Health Policy.

⁴⁶ Silberman, P., Poley, S., & Slifkin, R. (2003). [Innovative Primary Care Case Management Programs Operating in Rural Communities: Case Studies of Three States](#). Working Paper #76. North Carolina Rural Health Research Center.

⁴⁷ Poley, S., Silberman, P., & Slifkin, R. (2003). [Design of Enhanced Primary Care Case Management Programs Operating in Rural Communities: Lessons Learned from Three States](#). North Carolina Rural Health Research Center.

implemented in Florida, North Carolina, and Oklahoma, the authors found that while patients seemed to “benefit greatly from the additional clinicians and individualized care associated with case and disease management programs,” the dispersed proximity of patients and clinicians resulted in “increased use of case management by telephone,” which was problematic in nature due to the fact that “some Medicaid recipients do not have consistent access to telephones.” The authors state that case-management programs “can ensure the viability of rural primary care providers by guaranteeing a stream of revenue” but also caution that, in rural areas, a “lack of community resources to provide patient education or address psychosocial problems” may increase the workload of care managers, a topic which is examined in greater detail by the Maine RHRC and profiled below.

RHRC Research Reveals...

- Patients seem to benefit greatly from the additional clinicians and individualized care associated with case and disease management programs such as the Patient-Centered Medical Home (PCMH).
- Case-management programs can ensure the viability of rural primary care providers by guaranteeing a stream of revenue.
- In rural areas, a lack of community resources to provide patient education or address psychosocial problems may increase the workload of care managers.
- Rural communities have found success integrating mental health services with primary care.

The RUPRI RHRC is the first of the Federal Centers to examine the PCMH directly, with a research project in their current portfolio designed “to assess rural readiness seen as part of a PCMH.” RUPRI researchers plan to “design a rural readiness assessment tool and pilot-test the tool with two randomly-selected rural primary care practices in each of the nine census divisions.” This research will culminate in a policy brief and detailed issue paper.

This initiative builds upon expertise RUPRI developed with prior work focused on articulating a broad, rural-focused model for a continuum of health care, beginning with a working paper (2003)⁴⁸ and subsequent publication (2006)⁴⁹. These products “provide health care system planners and policymakers a rubric that focuses on the needs of rural people and places, rather than the wants of providers and constituencies,” and characterizes seven stages of rural health care services, “from personal behavior to palliative care.”

⁴⁸ Mueller, K.J. &MacKinney, A.C. (2003). [Care Across the Continuum: Access to Health Care Services in Rural America](#). Working Policy Paper P2003-10. RUPRI Rural Health Research Center.

⁴⁹ Mueller, K.J. &MacKinney, A.C. (2006). Care Across the Continuum: Access to Health Care Services in Rural America. *Journal of Rural Health*. 22(1), 43-49.

The Maine RHRC, with its expertise in rural mental health research, has produced two publications over the last decade relevant to new models for integrating mental health services with primary care in rural areas. One study (2006a)⁵⁰ asserts that “the integration of mental health and primary care services is a policy goal whose time has come,” and provides examples of ways in which rural communities have found success in this area. Another, produced later in the year in conjunction with the National Rural Health Association (2006b)⁵¹, provides five case studies which “show that rural primary care and mental health services can be integrated” productively. On a related note, the Office of Rural Health Policy funded an independent study (2006)⁵² which claims that “rural primary care providers will be the frontline providers of mental health services following bioterrorism” and underscores the basic argument put forth by the Maine RHRC in their work.

⁵⁰ Gale, J.A. & Lambert, D. (2006). [Mental Health Care in Rural Communities: the Once and Future Role of Primary Care](#). *North Carolina Medical Journal*. 67(1), 66-70.

⁵¹ Lambert, D., Bird, D.C., Hartley, D., & Genova, N. (2006). [Integrating Primary Care and Mental Health: Current Practices in Rural Community Health Centers](#). Maine Rural Health Research Center.

⁵² Tsao, J.C., Dobalian, A., Wiens, B.A., Gyls, J.A., & Evans, G.D. (2006). Posttraumatic Stress Disorder in Rural Primary Care: Improving Care for Mental Health Following Bioterrorism. *Journal of Rural Health*. 22(1), 78-82.

CONCLUSION

The vitality of rural America – currently home to nearly twenty percent of the U.S. population – rests in part on the vitality of the rural health workforce. When primary care services are inaccessible, of insufficient quality, or completely unavailable, residents and communities face debilitating consequences. More than three-quarters of the 2,050 rural counties in the United States are designated as primary care health professional shortage areas. Evidence tells us that in most respects, the demand for rural primary care providers is increasing at rates which exceed the current supply. In short, the prognosis is not good.

However, evidence also indicates that there are clear ways to increase the supply of primary care providers as well as the availability and efficiency of primary care services in rural areas. Recruiting students into medical school and health care training programs who are more likely to serve in rural areas, providing direct exposure to rural areas and rural health issues within these programs, offering financial incentives and lifestyle enhancements to providers who practice in rural areas, streamlining primary care – and enacting policies which promote & facilitate these initiatives – are some of the ways in which rural primary care workforce crises can be alleviated.

Most of these potential solutions are not new. In fact, much of the evidence-based research in this field reinforces claims and findings which have prevailed for decades. One distinct change, however, lies in the increased urgency of more recent research. Policy and place are fundamentally intertwined, and shape one another in complex ways. Health workforce research has, in recent years, made great towards understanding and clarifying the importance of that relationship.

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