



Rural Physician Literature Review

INTRODUCTION

The Colorado Health Institute (CHI) is developing a rural physician survey to be fielded in January 2009. The purpose of the study will be to inform legislators, providers, communities, the Colorado Area Health Education Centers, the Colorado Medical Society, COPIC Insurance, the Health Resources and Services Administration Region VIII Office and the Colorado University Denver School of Medicine about the unique challenges of recruiting and retaining physicians in rural Colorado. This literature review provides citations, short summaries and Web links to professional journal articles that CHI is referencing in the development of its rural physician questionnaire.

Though much research has been done surrounding the rural physician shortage nationally, no current data are available on the rural physician situation in Colorado. General themes found in the literature review point to the importance of a rural upbringing or exposure to a rural practice during medical training, the creation of more financial and community-based incentives, and the necessity of successful recruitment and retention program interventions in all stages of the medical school pipeline.

Eleven key questions formed the basis for this literature search and directed CHI to the articles that were deemed relevant. The articles reviewed are grouped accordingly. Because a number of the studies deal with multiple topics, one article may appear under several headings. Findings included, however, relate only to that question.

1. What factors contribute to a physician's decision to practice in a rural setting?
2. Based on their clinical and classroom training, how prepared are rural physicians to practice in a rural or geographically isolated community?
3. What are the key practice characteristics of physicians who practice in a rural setting, such as patient volume, number of employees, services provided and specialty area?
4. What are the key demographic characteristics—e.g., age, medical school training, how long in practice and board certification—of physicians practicing in a rural area?
5. What is the practice capacity of physicians practicing in a rural area to add new patients or modify their payer mix?
6. Do physicians practicing in a rural area differ from their urban counterparts in terms of hours worked or planned retirement?
7. Are there unique reimbursement issues that affect physicians practicing in a rural area with regard to Medicaid and Medicare?
8. What are rural physicians' attitudes with regard to specific health policy issues such as scopes of practice of allied health professionals, health care reform proposals, pay for performance, HIT and Telehealth?
9. Are spousal considerations important in recruitment and retention incentives offered to physicians considering a rural practice?
10. What community roles (e.g., county commissioner, school board member, etc.) or other factors outside of clinical practice influence retention?
11. What are successful community and/or employer recruitment and retention incentives (such as loan repayment, housing subsidy, longevity bonus, flex schedule or regular locum tenens support) for rural physicians?

LITERATURE REVIEW

I. What factors contribute to a physician's decision to practice in a rural setting?

Brooks, Robert G., Russell Mardon and Art Clawson (2003). "The rural physician workforce in Florida: A survey of U.S. and foreign-born primary care physicians." *The Journal of Rural Health* 19(4): 484-491.

Summary

A mail survey was administered to all of Florida's rural primary care physicians (399) and a 10 percent sampling (1,236) of urban and suburban primary care physicians. The study examined the demographics, training and future work plans of practicing rural primary care physicians. Common factors such as exposure to a rural setting in medical school or residency were found among physicians who chose to practice in a rural community. The survey had a 61 percent response rate with 1,000 physicians responding (272 rural, 385 urban and 342 suburban).

Key Findings

- Rural physicians were more likely to have been raised in a rural area, be foreign-born and trained and have a National Health Service Corps commitment or a J-1 visa waiver.
- Rural physicians were significantly more likely to be in family practice and less likely to be in internal medicine than urban primary care physicians.
- Rural physicians were more likely to have been exposed to rural medical practice or living in a rural environment during their medical school and residency training.
- Findings suggest that recruiting and retaining doctors in rural areas can best be supported through a mission-driven selection of medical students who are more prone to practicing in rural locations as well as a focus on subsequent training in medical school and residency in rural health issues.
- National programs such as the National Health Service Corps and the J-1 visa waiver program also play important roles in rural physician selection and should be taken into account when planning for future rural health care needs.

Crump, William J., D. Barnett and S. Fricker (2004). "A Sense of place: Rural training at a regional medical school campus." *The Journal of Rural Health* 20(1): 80-84.

Summary

This study reports on the general viability of a rural medical school campus in western Kentucky by using a survey of 76 students who had shown interest in this campus. The campus is located in Madisonville, Kentucky and is a rural satellite campus of the University of Louisville School of Medicine.

Key Findings

- Students not choosing the rural campus placed a higher priority on large-city amenities, better opportunities for their spouses and proximity to family in eastern and central Kentucky.
- Students who chose the rural campus placed a higher priority on one-on-one clinical training and interest in small-town life.
- Although many students originally interested in the rural campus were from rural backgrounds, many of them opted out of the Madisonville campus because they had family in eastern or central Kentucky.
- Students who chose the rural campus thought it would improve their residency prospects.
- The social isolation of a rural campus served as a large barrier for many students who originally contemplated attending medical school at Madisonville.

Easterbrook, M., et al. (1999). "Rural background and clinical rural rotations during medical training: Effect on practice location." *Canadian Medical Association Journal* 160(8) April: 1159-1164.

Summary

This study administered a cross-sectional mail survey to 159 physicians who completed a Family Medicine residency at Queen's University, Kingston, Ontario, between 1977 and 1991 to determine the factors that affect a family medicine resident's decision regarding practice location. Emphasis was placed on understanding the effects of a resident's background or exposure to rural practice during clinical rotations.

Key Findings

- Physicians who were raised in rural communities were more than twice as likely as those from non-rural communities to choose to practice in a rural community immediately after residency.
- Physicians with rural backgrounds were two-and-one-half times more likely to be in rural practice at the time of the survey (i.e. retention).
- Physicians exposed to rural practice during their undergraduate medical training were almost twice as likely to practice in a rural area immediately upon completion of their training.
- Though physicians exposed to rural practice during undergraduate training or residency programs were more likely to choose a rural community as their current practice location, the association was not deemed significant.

Ellsbury, K., et al. (2002). "Gender-related factors in the recruitment of physicians to the rural Northwest." *The Journal of the American Board of Family Medicine* 15(5) Sept/Oct: 391-400.

Summary

This study examined the differences in the factors that female and male physicians considered influential in their choice of a rural practice location, with an additional emphasis on describing the practice arrangements that successfully recruited female physicians. The study included a mailed survey of physicians successfully recruited between 1992 and 1999 to towns of 10,000 residents or less in six states in the Pacific Northwest.

Key Findings

- 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 child care and the interpersonal aspects of recruitment.
- Common themes of respondents were the desire for flexibility regarding family issues and the value they placed on honesty during recruitment.
- The most common concerns, as shown by frequency of comments in response to open-ended questions regarding aspects of the recruitment process, were: community-related factors, e.g., setting, economic base, population characteristics, schools, facility and practice setting such as practice structure and work schedule, and presence of colleagues.
- The most frequent reasons, in order, for not choosing other practices overall were related to: community, colleagues and facility and practice setting.
- Men ranked facility and practice as more influential than colleagues.
- Women ranked practice and financial arrangements before facility and practice.
- Recruitment strategies thought to be most successful were, in descending order: good interpersonal communication, e.g., friendliness and level of interest shown by those involved in recruiting; highlighting the positive aspects of the practice, e.g., conveying a sense of priorities; flexibility in scheduling; and offering financial incentives, such as salary, benefits and loan repayment.

- Most common advice for recruitment efforts was cultivating good recruitment relationships; offering attractive practice arrangements, e.g., good balance between professional and personal life; and emphasizing the strengths of the existing medical community.

Fryer, G.E., et al. (1998). "Personal and educational background predictors of physician practice profiles: The case of Colorado." *Evaluation and Programming Planning* 21: 307-314.

Summary

Using a statewide survey sent out with 1995 licensure renewals this study assessed the professional practice profiles of 5,767 Colorado physicians who had completed residency training. The purposes of the mailed survey were to: 1) evaluate the contribution of Colorado's undergraduate and graduate medical education programs to recruitment of physicians within the state; and 2) assess the relationship between practice profiles and physicians' demographic and other background variables. The goal of the assessment was to better understand the factors that should be considered in evaluating applications for medical school and /or residency program admissions.

Key Findings

- Physicians who had grown up in rural Colorado were more likely to establish primary care practices (61.5%) in a non-metropolitan area of the state.
- Female physicians were more likely to choose a primary care specialty, while male physicians were more likely to serve Medicaid patients.
- Minority physicians were overrepresented among generalists, provided more direct patient care (50 hours/week) and were more willing to provide care to Medicaid patients (88.7%) than other physicians included in the analysis.
- Primary care specialties were popular among physicians with Colorado backgrounds.
- Although males outnumbered female physicians within each ethnic group, women made up a larger percentage of minority doctors (27.5% vs. 19.4 %).
- Having grown up in Colorado was significantly associated with choosing a rural practice in Colorado.
- Male physicians spent more hours weekly in direct patient care than did female physicians within each ethnic group reported.
- Only female Asian physicians served more Medicaid patients than their male counterparts (89.6% vs. 84.2%).
- Minority female physicians who grew up in Colorado and were raised in a rural area tended to become generalists.
- Primary care medicine was popular among physicians who trained in a Colorado residency program and this relationship was much stronger for DOs than MDs (76.1% vs. 40.3%).

Hart, G. et al. (2002). "Rural health care providers in the United States." *The Journal of Rural Health* 18(5) Supplemental: 211-32.

Summary

This literature review identifies the challenges for rural health researchers and policymakers with regard to estimating health care provider supply. Physician supply, geographic and specialty distribution, age, gender, quality of care, recruitment and retention, training, productivity and income, reimbursement and managed care, federal and state ameliorative programs, safety net and telehealth were each discussed.

Key Findings

- Specialty choice is the most powerful predictor of choosing a rural practice location with family practitioners being much more likely than other specialists to locate in a rural area.
- Despite a steady increase in the number of female physicians being trained, women are substantially less likely to locate in a rural area than male physicians.
- Four basic “truths” exist in terms of rural health: students with rural origins are more likely to train in primary care and return to a rural area; residents trained in a rural area are more likely to choose to practice in rural areas; family medicine is the primary specialty of rural health providers and residents tend to practice close to where they grew up.
- Characteristics of successful graduate medical education training programs include: rural tracks implemented into the medical school curriculum, fellowships offered, an explicit rural mission statement and a residency director with rural experience.
- Three overriding barriers were found to rural residency training: inadequate reimbursement, stringent residency review committee requirements and the overall health of the rural practice environment.

Krist, A.H., et al. (2005). “Title VII funding and physician practice in rural or low-income areas.” *The Journal of Rural Health* 21(1): 3-11.

Summary

Researchers assessed the relationship between the availability of federal Title VII funding in medical school, residency or both, as well as the number of family physicians practicing in rural or low-income communities. The 2000 American Academy of Family Physicians physician database, Title VII funding records and 1990 U.S. Census data were used for this study of 9,107 family physicians practicing in representative states in the year 2000. Created by 1963 federal legislation to increase the general supply of physicians, Title VII funding has since evolved with successive re-authorizations to target the education and training of primary care providers who make a commitment to serve in a medical or dental underserved area.

(HRSA, <http://bhpr.hrsa.gov/medicinedentistry/actpcmd/reports/fifthreport/3.htm>)

Key Findings

- Medical students or residents provided Title VII funding were more likely to practice in a low-income community or rural area.
- Physicians who attended a medical school or residency program that had at least five years of Title VII funding were more likely to practice in a rural community.
- The combination of exposure to Title VII funding in both medical school plus a residency program was associated with a greater likelihood of practicing in an underserved community than exposure in only medical school or a residency program.

Laven, G.A., et al. (2003). “Factors associated with rural practice among Australian-trained general practitioners.” *Medical Journal of Australia* 179 (July): 75-79.

Summary

This study assessed the factors that were associated with the choice of practice location of general practitioners with an emphasis on rural locations. The study design was retrospective and observational using a self-administered questionnaire of 2,414 Australian-trained rural and urban general practitioners.

Key Findings

- Rural general practitioners were more likely to be male, Australian citizens and to have attended a rural elementary school for “some” or “all” of their primary schooling.
- Rural general practitioners’ partners/spouses were also more likely to report “some” or “all” of their elementary schooling completed in a rural area.
- The highest likelihood of choosing a rural practice occurred when both the physician and his or her partner/spouse had a rural background.

Tolhurst, H.M., J. Adams and S.M. Stewart (2006). “An exploration of when urban background medical students become interested in rural practice.” *Rural and Remote Health* 6(452): 1-11.

Summary

This study explored the factors that influence medical students’ interest in choosing a rural practice by using a qualitative focus group research design involving 82 first- and fourth-year medical students of which 49 also participated in semi-structured interviews.

Key Findings

- Factors found to influence medical students with an urban background to report an interest in a rural practice included:
 - Social and geographic familiarity
 - Altruism and wanting “to make a difference in peoples’ lives”
 - Varied and diverse opportunities presented by a rural practice
 - Interest in a perceived “short-term adventure” resulting from a rural practice setting
 - Exposure to a rural experience because of family ties, foreign service, etc.
 - Interest in rural practice occurring after a mandatory clinical rotation in rural setting
 - A positive role model
 - Scholarship opportunities such as the National Service Corps, service-for-loan repayment, etc.
 - Students expressed a common concern for professional opportunities for their significant other.
 - The study found the career choice between specialty and general practice may be based more on emotional or cultural factors than on rational and factual reasons.

Rabinowitz, Howard K., et al. (1999). “A program to increase the number of family physicians in rural and underserved areas: Impact after 22 years.” *The Journal of the American Medical Association* 281(3): 255-60.

Summary

This study is a retrospective cohort study aimed at determining the direct and long-term impacts of Jefferson Medical College’s Physician Shortage Area Program (PSAP) on the rural physician workforce supply in Pennsylvania and Delaware. Data from physicians practicing in Pennsylvania who graduated from medical school from 1978 to 1991 were gathered from the 1997 American Medical Association Physician Master File. The PSAP is an admissions and educational program designed to increase the supply and retention of family physicians in rural areas and small towns, especially in Pennsylvania and Delaware.

Key Findings

- PSAP graduates accounted for 21% of family physicians who graduated from one of the state’s seven medical schools and were practicing in rural Pennsylvania, even though they represented only 1% of the total graduates from these schools.

- PSAP graduates were much more likely than their non-PSAP classmates to practice in a rural area of the United States (34% vs. 11%).
- PSAP graduates were much more likely than their non-PSAP classmates to practice in an underserved area (30% vs. 9%).
- PSAP graduates were much more likely than their non-PSAP classmates to practice family medicine (52% vs. 13%).
- PSAP graduates were much more likely than their non-PSAP classmates to have combined a career in family practice with practice in a rural area (21% vs. 2%).
- Of PSAP graduates, 84% were practicing in either a rural or small metropolitan area or in one of the primary care specialties.
- PSAP graduate retention rates were high: the number of PSAP graduates practicing rural family medicine represented 87% of those practicing five to 10 years earlier and the number of PSAP graduates practicing in underserved areas represented 94% of those practicing five to 10 years earlier.

Rabinowitz, Howard K., et al. (2000). "The impact of multiple predictors on generalist physicians' care of underserved populations." *American Journal of Public Health* 90(8) August: 1225-28.

Summary

Using survey results from a 1993 national random sample of 2,955 allopathic and osteopathic generalist physicians who graduated in 1983 and 1984, this study examined the relative and additive importance of predictors of generalist physicians' choosing to provide a significant level of care to underserved populations. Factors that potentially influenced physicians' decisions to practice in a rural area were also examined.

Key Findings

- Four independent predictors of the likelihood of providing care to an underserved population were identified: (1) being a member of an underserved ethnic/minority group, (2) having participated in the National Health Service Corps, (3) having a strong interest in practicing in an underserved area prior to attending medical school, and (4) growing up in an underserved area.
- Approximately 86% of physicians with all four predictors were providing substantial care to underserved populations.
- 65% of physicians with three predictors were providing substantial care to underserved populations.
- Less than half (49%) of physicians with two predictors were providing substantial care to underserved populations.
- One-third (34%) of physicians with one predictor were providing substantial care to underserved populations.
- 22% of physicians with none of the predictors were providing substantial care to underserved populations.

Somers, George T., Amanda E. Young and Roger Strasser (2001). "Rural career choice issues as reported by first-year medical students and rural general practitioners." *Australian Journal of Rural Health* 9: 6-13.

Summary

This analysis of two survey-based studies of 127 first-year medical students at Monash University and of 1,373 general practitioners in rural Australia in 1996-97 investigated whether recruitment and retention

interventions designed for general practitioners were equally applicable to undergraduate medical students.

Key Findings

- While similarities were found between rural general practitioners and undergraduate medical students, the differences were significant enough for the study authors to recommend the development of separate intervention programs.
- Factors that scored higher by medical students included:
 - Access to health care for their own needs
 - Availability of professional development activities once in practice
 - Availability of child care
 - Opportunities to practice in public health
 - Availability of other health and human services
 - Access to social/family networks
 - Cost of living
- Factors scoring higher by general practitioners included:
 - Sense of professional independence
 - Ability to take an annual vacation and other leave opportunities.
- First-year medical students (regardless of gender) and female general practitioners practicing in rural areas showed the most similarity in terms of importance of factors influencing them to choose a rural practice. The research team suggested this may be a cultural shift in a younger generation of medical students.

Additional Findings

- Medical students with an urban background consistently rated income as a higher priority than students with a rural background.
- Medical students with a rural background consistently rated the nature of the community and a sense of belonging as more important than urban students.

Blue, Amy V., et al. (2004). "Medical students' perceptions of rural practice following a rural clerkship." *Family Medicine* 36(5) May: 36-40.

Summary

In order to examine medical students' perceptions about a rural primary care practice, this study administered questionnaires to third-year students both before and after a required rural clerkship.

Key Findings

- Students' perceptions of rural primary care physicians' medical competencies increased significantly after a rural clerkship.
- Having a rural experience in medical school had a significant and positive influence on a student's decision to practice in a rural community.
- Prior to their clerkship, medical students believed that rural primary care physicians had more work demands, lower income potential, comparable medical expertise and a more focused primary care practice than their urban/suburban counterparts; following their clerkship, students' perceptions significantly changed.
- After their clerkship, medical students still viewed clinical demands in a rural practice as greater than urban or suburban areas, but also assessed the clinical competencies higher among rural physicians.

Daniels, Zina M., et al. (2007). "Factors in recruiting and retaining health professionals for rural practice." *The Journal of Rural Health* 23(1) Winter: 62-71.

Summary

This study assessed factors associated with successful rural recruitment and retention strategies for graduates from a variety of health professional programs. A mailed survey of graduates from 12 health professional programs in New Mexico was used to collect these longitudinal data.

Key Findings

- Size of childhood town, completing a rural practicum, discipline and age at graduation were all associated with choosing a rural practice.
- Health professional graduates who first practiced in a rural area were more likely to view the following factors as important to their rural practice decision: community need, financial aid, size of community, returning to one's hometown and participation in a rural training program.
- The following factors were considered important to all graduates when choosing jobs regardless of the location where they ended up practicing: Sufficient work to support a family, job security, Income potential, opportunities for professional development and the desire to meet a community's health care needs.
- A rural rotation in medical school and additional rural training opportunities were found to be associated with retention upon graduation and setting up practice in a rural area.

Hyer, J.L., et al. (2007). "Rural origins and choosing family medicine predict future rural practice." *The Robert Graham Center* no. 49. (Retrieved September 3, 2008, from: <http://www.graham-center.org/x921.xml>)

Summary

This article summarizes various studies and literature on the issue of the shortage of physicians in U.S. rural practice.

Key Findings

- Two medical student characteristics that predict eventual practice in rural settings were being born in a rural county and choosing a residency in family medicine.
- 21% of the population of the United States lives in rural areas, but only 10% of physicians practice in rural communities.
- 58% of physicians in isolated rural areas are family medicine specialists.
- Students from rural counties are four times more likely to practice medicine in a rural area than students from urban counties.
- Barriers to medical training for students of rural origin included lower educational and socioeconomic status; fewer role models; less encouragement to pursue higher degrees; fewer extra-curricular and academic activities; less access to technology and the need to travel to pursue a college degree.

Kassebaum, Donald G., and Philip L. Szenas (1993). "Rural sources of medical students and graduates' choice of rural practice." *Academic Medicine* 68(3): 232-236.

Summary

This study utilized the Association of American Medical Colleges' 1998 Matriculating Student Questionnaire and the 1992 Medical School Graduation Questionnaire to compare students' initial

intentions with practice plans and specialty certifications of rural students enrolled in U.S. medical schools from 1982-92.

Key Findings

- Medical students with rural backgrounds were four times more likely than students with non-rural ties to plan a rural practice at matriculation (16.2% vs. 4.1%) and at graduation (13.2% vs. 3.2%).
- The overall percentage of students declaring interest in rural practice dropped between matriculation and graduation (6.2% to 5.0%).
- A large majority of the graduating medical students planning a rural practice also planned to seek certification in a generalist specialty (72.5%).
- Students with rural ties, such as having family members in a rural area or acquiring some education in rural regions, had a greater interest in rural practice than those with rural backgrounds.
- Interest in rural practice was much greater among graduating students intending to specialize in family practice.
- Though medical students with rural ties were more likely than students with non-rural backgrounds to seek certification in one of the generalist specialties and to plan rural practices, they made up only 17% of the enrollment in U.S. medical schools and only 5% of these students contemplated rural practice after graduation.

Pathman, D.E., et al. (2000). "Medical training debt and service commitments: The rural consequences." *The Journal of Rural Health* 16(3) Summer: 264-272.

Summary

This study assessed how student loan debt, scholarships and loan repayment programs with service requirements affected a physician's decision to pursue higher income practices in non-rural settings and limit or refuse to accept Medicaid and/or uninsured patients. Data were collected from a 1999 mail survey of a national probability sample of 468 practicing family physicians, general internists and pediatricians who graduated from U.S. medical schools between 1988 and 1992. The study further investigated how educational costs influenced primary care physicians' participation in loan repayment programs and how these programs affected their practice location, income and the patients seen in their practice.

Key Findings

- In their first job after residency, family physicians and pediatricians with greater debt reported caring for more Medicaid or uninsured patients than physicians with less debt.
- Physicians in loan repayment programs were more likely to work in a rural area compared to those without obligations (33% vs. 7%).
- Physicians in loan repayment programs provided more care to Medicaid and uninsured patients when compared to those without obligations (53% vs. 29%).
- The high cost of medical education is directly related to participation in federal and state loan repayment programs that require service in a medically underserved area, thus, national workforce goals partially get met through these financial incentive strategies.

Rabinowitz, Howard K., and Nina P. Paynter (2000). "The role of the medical school in rural Graduate Medical Education: Pipeline or control valve?" *The Journal of Rural Health* 16(3) Summer: 249-253.

Summary

The experience of the Jefferson Medical College's Physician Shortage Area Program (PSAP) in Philadelphia was supplemented with published literature from six other medical school programs to inform this analysis of rural clerkships that occur in the early years of medical education. All programs analyzed had three core features: (1) a strong institutional mission, (2) the targeted selection of students likely to practice in rural areas and (3) a focus on primary care, especially family practice.

Key Findings

- All seven programs were highly successful at increasing the number of medical students that went into family practice or other primary care specialties as well as the number of graduates that chose to practice in a rural area.
- At Jefferson, PSAP graduates were three times more likely than their peers (34% vs. 11%) to practice in a rural (i.e., non-Standard Metropolitan Statistical Area) location (throughout the U.S.).
- PSAP graduates were four times more likely (52% vs. 13%) to go into a family medicine residency.
- PSAP graduates were more than 8 times more likely (21% vs. 2%) to have chosen a career in family medicine in a rural area.
- The majority of PSAP graduates (84%) were practicing in either a rural or small metropolitan area in primary care.
- PSAP program graduates reported high retention rates in their first post-graduate training practice—87% were practicing rural family medicine in the same practice 5-10 years after residency.
- Analysis of the Jefferson Medical College experience found six factors important to its success: the rural background of medical students in the programs; first-year medical school plans to practice family medicine; participation in the PSAP; participation in a senior rural rotation in the fourth year and participation in the National Health Service Corps scholarship program.
- Graduates from all seven programs were highly likely to practice in family medicine or another primary care specialty.

Silagy, Christopher A., and Leon Piterman (1991). "Attitudes of senior medical students from two Australian schools towards rural training and practice." *Academic Medicine* 66(7): 417-419.

Summary

This study assessed the attitudes of senior medical students in two universities in Victoria, Australia, about factors influencing the choice of location for postgraduate training and ultimately first practice location. A cross-sectional, self-administered questionnaire was used.

Key Findings

- A large majority (87%) of the responding students reported wanting to do their internship training in a metropolitan hospital if given the choice.
- The two major reasons for choosing a metropolitan internship were issues related to a partner or family (mentioned by 38% of students) and better training and educational opportunities in a metropolitan area (33%).

Wolf, Murray A., Vicki L. Uchill and Itzhak Jacoby (1981). "Demographic factors associated with physician staffing in rural areas: The experience of the National Health Service Corps." *Medical Care* 19(4) April: 444-451.

Summary

This study examined the social and economic forces that influence a rural community's ability to attract physicians. By assessing the county level characteristics of National Health Service Corps (NHSC) sites, the study identified significant demographic differences between communities in which NHSC sites were successful versus those that were unsuccessful in obtaining physicians.

Key Findings

- Communities in which a NHSC site had not previously had a physician had a median family income 15% lower than communities with a previously staffed NHSC site.
- Communities with staffed NHSC sites had a significantly higher percentage of white collar jobs than never-staffed site counties.
- Communities with a previously staffed NHSC site were more likely to have higher educated residents (more years of schooling) than communities that were not previously staffed.
- 64% of the not previously staffed NHSC sites were located in the southeast region of the country.

2. Based on their clinical and classroom training, how prepared are rural physicians to practice in a rural or geographically isolated community?

Brooks, Robert G., Russell Mardon and Art Clawson (2003). "The rural physician workforce in Florida: A survey of U.S. and foreign-born primary care physicians." *The Journal of Rural Health* 19(4): 484-91.

Summary

A mail survey was administered to all of Florida's rural primary care physicians (399) and a 10 percent sampling (1,236) of urban and suburban primary care physicians. The study examined the demographics, training and future work plans of practicing rural primary care physicians. Common factors such as exposure to a rural setting in medical school or residency were found among physicians who chose to practice in a rural community. The survey had a 61 percent response rate with 1,000 physicians responding (272 rural, 385 urban and 342 suburban).

Key Findings

- In terms of preparedness, rural primary care physicians had more self-reported confidence in their ability to:
 - Build relationships in the community
 - Locate health resources available in the community for patients
 - Employ the full range of community health services for patients
 - Understand the community's perception of its health problems
 - Engage community members in efforts to address a local health problem.

Hunsaker, M.L., M.L. Glasser, K.M. Neilson and M.S. Lipsky (2006). "Medical students' assessments of skill development in rural primary care clinics." *Rural and Remote Health* 6(616):1-12.

Summary

This study assessed the impact of a four-month rural primary care preceptorship on medical students' perceived ability to provide acute, chronic and preventive care, to perform procedures, to communicate with patients and to understand the community and its health care resources. Ninety-six students were surveyed about their self-assessed skills on 11 dimensions of practice immediately before and after a 16-week preceptorship in a rural primary care clinic.

Key Findings

- Post-preceptorship:
- Students reported that their skills had increased significantly in all dimensions of practice.
- Students rated most highly the skills required to manage chronic health problems, providing patient education and the ability to handle undifferentiated acute problems.
- The largest perceived gain in skills was a better understanding of local health care resources and the community.
- Students ranked lowest their skills in performing procedures [a finding the authors termed surprising and of concern since rural family physicians tend to perform a wider variety of procedures than urban physicians].
- Students viewed their preceptorship as a significant educational benefit.

Stearns, Jeffrey A., and Marjorie A. Stearns (2000). "Graduate medical education for rural physicians: Curriculum and retention." *The Journal of Rural Health* 16(3): 273-277.

Summary

This study reviews the 1994 American Academy of Family Physicians' (AAFP) rural training recommendations in light of several educational needs assessments.

Key Findings

- Rural residency rotations are needed, as is maintenance and better implementation of AAFP's rural clinical training guidelines.
- Clinical knowledge and procedural skills areas, instruction and experiences relating to the "realities of rural living" need to be enhanced to increase the retention of rural physicians. This includes more emphasis in the curriculum on developing community health competencies and community-oriented primary care. [Community-oriented primary care (COPC) includes familiarity with community health resources; awareness of the socio-cultural aspects patient care; attention to community participation and assimilation; and the identification of the community's health problems and development of interventions to address the problems.]
- Facilitating improved training opportunities in these domains could lead to higher retention rates among rural physicians.
- Physicians who know how to collaborate with community members on health improvement projects have skills that can also facilitate integration of physicians into rural communities, both of which lead to retention.

3. What are the key practice characteristics of physicians who practice in a rural setting, such as patient volume, number of employees, services provided and specialty area?

Ellsbury, K., et al. (2002). "Gender-related factors in the recruitment of physicians to the rural Northwest." *The Journal of the American Board of Family Medicine* 15(5) Sept/Oct: 391-400.

Summary

This study examined the differences in the factors that female and male physicians considered influential in their choice of a rural practice location, with an additional emphasis on describing the practice arrangements that successfully recruited female physicians. The study included a mailed survey of physicians successfully recruited between 1992 and 1999 to towns of 10,000 residents or less in six states in the Pacific Northwest.

Key Findings

- 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 child care and the interpersonal aspects of recruitment.
- Common themes of respondents were the desire for flexibility regarding family issues and the value they placed on honesty during recruitment.
- The most common concerns, as shown by frequency of comments in response to open-ended questions regarding aspects of the recruitment process, were: community-related factors, e.g., setting, economic base, population characteristics, schools, facility and practice setting such as practice structure and work schedule, and presence of colleagues.
- The most frequent reasons, in order, for not choosing other practices overall were related to: community, colleagues and facility and practice setting.
- Men ranked facility and practice as more influential than colleagues.
- Women ranked practice and financial arrangements before facility and practice.
- Recruitment strategies thought to be most successful were, in descending order: good interpersonal communication, e.g., friendliness and level of interest shown by those involved in recruiting; highlighting the positive aspects of the practice, e.g., conveying a sense of priorities, flexibility in scheduling; and offering financial incentives, such as salary, benefits and loan repayment.
- Most common advice for recruitment efforts was cultivating good recruitment relationships; offering attractive practice arrangements, e.g., good balance between professional and personal life; and emphasizing the strengths of the existing medical community.

Luman, Kyle, John Zweifler and Kevin Grumbach (2007). "Physician perceptions of practice environment and professional satisfaction in California: From urban to rural." *The Journal of Rural Health* 23(3) Summer: 222-27.

Summary

This study analyzed a self-administered questionnaire of 2,240 primary care and specialist physicians identified from the American Medical Association's Physician Master File in California (administered between 2001- 02). The purpose was to better understand the differences between rural and urban physician' perceptions of their practice environments.

Key Findings

- Primary care physicians practicing in a rural area defined as nonadjacent or small non-metropolitan counties were the least likely to report pressures to see more patients, limit referrals and limit treatment options.
- Specialists in rural areas that are within a metropolitan area (or in large adjacent non-metropolitan counties) were more likely than urban specialists to report practice pressures.
- Although rural physicians in primary care and specialties reported difficulty in attracting new physicians to their community, they also reported a better practice climate overall than their urban counterparts.
- Physicians in the nonadjacent or small non-metropolitan category were the most satisfied while specialists in the nonadjacent or small non-metropolitan category were the least satisfied with their practice environment.
- Among primary care physicians, family physicians were the most likely to practice in a rural area (29% of urban and 55% of rural primary care physicians).

Fryer, G.E., et al. (1998). "Personal and educational background predictors of physician practice profiles: The case of Colorado." *Evaluation and Programming Planning* 21: 307-314.

Summary

Using a statewide survey sent out with 1995 licensure renewals this study assessed the professional practice profiles for 5,767 Colorado physicians who had completed residency training. The purposes of the mailed survey were to: 1) evaluate the contribution of Colorado's undergraduate and graduate medical education programs to recruitment of physicians within the state; and 2) assess the relationship between practice profiles and physicians' demographic and other background variables. The goal of the assessment was to better understand the factors that should be considered in evaluating applications for medical school and /or residency program admissions.

Key Findings

- Physicians who had grown up in rural Colorado were more likely to establish primary care practices (61.5%) in a non-metropolitan area of the state.
- Female physicians were more likely to choose a primary care specialty and male physicians were more likely to serve Medicaid patients.
- Minority physicians were overrepresented among generalists, provided more direct patient care (50 hours/week) and were more willing to provide care to Medicaid patients (88.7%) than other physicians included in the analysis.
- Primary care specialties were popular among physicians with Colorado backgrounds.
- Although males outnumbered female physicians within each ethnic group, women made up a larger percentage of minority than non-minority doctors (27.5% vs. 19.4 %).
- Having grown up in Colorado was significantly associated with choosing a rural practice in Colorado.
- Male physicians spent more hours weekly in direct patient care than did female physicians within each ethnic group reported.
- Only female Asian physicians served more Medicaid patients than their male counterparts (89.6% vs. 84.2%).
- Minority female physicians who grew up in Colorado and were raised in a rural area tended to become generalists.
- Primary care medicine was popular among physicians who trained in a Colorado residency program and this relationship was much stronger for DOs than MDs (76.1% vs. 40.3%).

Pathman, Donald E., Eric S. Williams and Thomas R. Konrad (1996). "Rural physician satisfaction: Its sources and relationship to retention." *The Journal of Rural Health* 12(5) Fall: 366-377.

Summary

This study used survey data of primary care physicians who moved to nonmetropolitan areas nationwide from 1987-90 to identify factors related to satisfaction and/or dissatisfaction for primary care physicians working in rural areas. The study also aimed to identify the specific areas of satisfaction associated with longer retention within a given rural practice as well as the characteristics of individuals, practices, jobs and communities associated with satisfaction that might predict retention. Physicians serving in the National Health Service Corps (NHSC) were excluded from the study.

Key Findings

- The areas of greatest satisfaction among rural physicians were their relationships with patients, clinical autonomy, providing care to medically needy patients and life in a small community.
- Physicians were least satisfied with lack of access to urban amenities, the amount of time they have away from work and bureaucratic interference.

- Physician satisfaction did not necessarily lead to retention as retention was independently associated with physicians' satisfaction with their community and opportunities to achieve professional goals.
- Retention was only marginally related to physicians' satisfaction with their earnings.
- The areas of satisfaction not related to retention were: autonomy, access to medical information and consultants and the quality of the doctor-patient relationship.
- Physicians with previous personal connections to the communities in which they worked had significant satisfaction advantages, emphasizing the importance of personal-level relationships and integration within the community in which they worked.

Pathman, D.E., et al. (2000). "Medical training debt and service commitments: The rural consequences." *The Journal of Rural Health* 16(3) Summer: 264-272.

Summary

This study assessed how student loan debt, scholarships and loan repayment programs with service requirements affected a physician's decision to pursue higher income practices in non-rural settings and limit or refuse to accept Medicaid and/or uninsured patients. Data were collected from a 1999 mail survey of a national probability sample of 468 practicing family physicians, general internists and pediatricians who graduated from U.S. medical schools between 1988 and 1992. The study further investigated how educational costs influenced primary care physicians' participation in loan repayment programs and how these programs affected their practice location, income and the patients seen in their practice.

Key Findings

- In their first job after residency, family physicians and pediatricians with greater debt reported caring for more Medicaid or uninsured patients than physicians with less debt.
- Physicians in loan repayment programs were more likely to work in a rural area compared to those without obligations (33% vs. 7%).
- Physicians in loan repayment programs provided more care to Medicaid and uninsured patients when compared to those without obligations (53% vs. 29%).
- The high cost of medical education is directly related to participation in federal and state loan repayment programs that require service in a medically underserved area, thus, national workforce goals partially get met through these financial incentive strategies.

Shi, Leiyu, et al. (1998). "Physician practice characteristics and satisfaction: A rural-urban comparison of medical directors at U.S. Community and Migrant Health Centers." *The Journal of Rural Health* 14(4) Fall: 346-56.

Summary

Using data from a 1996 cross-sectional survey of Community and Migrant Health Center (C/MHCs) medical directors, this study examined the associations between physician practice characteristics and satisfaction of medical directors at rural and urban C/MHCs.

Key Findings

- The majority of medical directors (82.3%) were satisfied with their work.
- Satisfaction with work was most significantly associated with overall level of satisfaction, followed by satisfaction with administration, peers and patients.
- Recruitment efforts were more likely to succeed when they targeted individuals with prior experience in an underserved area.

- The average C/MHC medical director had been in medical practice for more than 12 years and served as medical director for 4.6 years.
- On average, rural medical directors saw about 20 more patients each week than their urban peers (78.8 rural vs. 57 urban).
- While average income was a reflection of the center's size (urban centers were larger than rural centers), urban medical directors earned significantly more (\$105,580) than their rural peers (\$96,620).
- Rural medical directors spent, on average, more time in patient care than urban medical directors (26.35 hours vs. 20.72 hours, respectively).
- Urban medical directors were likely to spend more time in various administrative tasks (e.g., supervisory activities, teaching and training, committees and meetings, quality assurance, etc.) than their rural counterparts.

4. What are the key demographic characteristics—age, medical school training, how long in practice and board certification—of physicians practicing in a rural area?

Baldwin, Laura-Mae, et al. (1999) "Rural and urban physicians: Does the content of their Medicare practices differ?" *The Journal of Rural Health* 15(2): 240-51.

Summary

This study used 1994 Medicare claims data from Washington State to examine whether differences in the availability of medical technology, the structure of a medical practice and characteristics of patient populations were associated with variation in the content of practice between physicians practicing in rural and urban areas. The study compared the number of patients, outpatient and inpatient visits, diagnosis clusters, patient age and sex and procedure frequency by board-certified rural and urban physicians in 12 ambulatory care medical specialties.

Key Findings

- Rural physicians were older and less likely to be female than urban physicians.
- Rural physicians saw larger number of elderly patients and had higher volumes of outpatient visits than their urban counterparts.
- Family physicians were most likely to practice in rural areas (25%).
- Psychiatrists (5%), cardiologists (6%), and gastroenterologists (8%) were least likely to practice in rural areas.

Brooks, Robert G., Russell Mardon and Art Clawson (2003). "The rural physician workforce in Florida: A survey of U.S. and foreign-born primary care physicians." *The Journal of Rural Health* 19(4): 484-491.

Summary

A mail survey was administered to all of Florida's rural primary care physicians (399) and a 10 percent sampling (1,236) of urban and suburban primary care physicians. The study examined the demographics, training and future work plans of practicing rural primary care physicians. Common factors such as exposure to a rural setting in medical school or residency were found among physicians who chose to practice in a rural community. The survey had a 61 percent response rate with 1,000 physicians responding (272 rural, 385 urban and 342 suburban).

Key Findings

- Rural physicians were more likely to have been raised in a rural area, be foreign-born and trained and have a National Health Service Corps commitment or a J-1 visa waiver.

- Rural physicians were significantly more likely to be in family practice and less likely to be in internal medicine than urban primary care physicians.
- Rural physicians were more likely to have been exposed to rural medical practice or living in a rural environment during their medical school and residency training.
- Findings suggest that recruiting and retaining doctors in rural areas can best be supported through a mission-driven selection of medical students who are more prone to practice in a rural area as well as a focus on rural content in medical school and residency programs.
- National programs such as the National Health Service Corps and the J-1 visa waiver program play an important role in physicians choosing a rural practice and should be taken into account when planning for future rural health care needs.

Ellsbury, Kathleen, E., et al. (2002). "Gender-related factors in the recruitment of physicians to the rural Northwest." *The Journal of the American Board of Family Medicine* 15(5) Sept/Oct: 391-400.

Summary

This study examined differences in the factors that female and male physicians considered important in their choice of a rural practice location. The study included a mailed survey of physicians successfully recruited between 1992 and 1999 to towns of 10,000 residents or less in six states in the Pacific Northwest.

Key Findings

- Women were more likely than men to have been influenced in making their practice location decision by issues related to their spouse/partner, flexible scheduling, family leave, availability of child care and the interpersonal aspects of recruitment. Common themes were the desire for flexibility with regard to family issues and the value they placed on honesty during recruitment.
- Compared with their male counterparts, rural female respondents were younger, less likely to be married or partnered, had fewer children and were more likely to have recently completed their residency program.

Fryer, G.E., et al. (1998). "Personal and educational background predictors of physician practice profiles: The case of Colorado." *Evaluation and Programming Planning* 21: 307-314.

Summary

Using a statewide survey sent out with 1995 licensure renewals this study assessed the professional practice profiles for 5,767 Colorado physicians who had completed residency training. The purposes of the mailed survey were to: 1) evaluate the contribution of Colorado's undergraduate and graduate medical education programs to recruitment of physicians within the state; and 2) assess the relationship between practice profiles and physicians' demographic and other background variables. The goal of the assessment was to better understand the factors that should be considered in evaluating applications for medical school and /or residency program admissions.

Key Findings

- Physicians who had grown up in rural Colorado were more likely to establish a primary care practice (61.5%) in a non-metropolitan area of the state.
- Female physicians were more likely to choose a primary care specialty.
- Male physicians were more likely to serve Medicaid patients.
- Minority physicians were overrepresented among generalists, provided more direct patient care (50 hours/week) and were more willing to provide care to Medicaid patients (88.7%) than other physicians included in the analysis.

- Primary care specialties were popular among physicians with Colorado backgrounds.
- Although males outnumbered female physicians within each ethnic group, a larger percentage of minority physicians were women (27.5% vs. 19.4 %).
- Having grown up in Colorado was significantly associated with choosing a rural practice in Colorado.
- Male physicians spent more hours weekly in direct patient care than did female physicians within each ethnic group reported.
- Only female Asian physicians served more Medicaid patients than their male counterparts (89.6% vs. 84.2%).
- Minority female physicians who grew up in Colorado and were raised in a rural area tended to become generalists.
- Primary care medicine was popular among physicians who trained in a Colorado residency program and this relationship was much stronger for DOs than MDs (76.1% vs. 40.3%).

Hart, Gary, et al. (2002). "Rural health care providers in the United States." *The Journal of Rural Health* 18(5) Supplemental: 211-32.

Summary

This literature review identifies the challenges for rural health researchers and policymakers with regard to estimating health care provider supply. Physician supply, geographic and specialty distribution, age, gender, quality of care, recruitment and retention, training, productivity and income, reimbursement and managed care, federal and state ameliorative programs, safety net and telehealth were each discussed.

Key Findings

- In general, rural areas had 20% more uninsured people than did urban areas.
- Osteopathic physicians made up 5% of the rural physician workforce and were more likely than allopathic physicians to practice as a generalist.
- Osteopaths were significantly more likely than allopathic physicians to settle and remain in rural areas (18.1% of osteopaths vs. 11.5% of allopaths).
- Specialist physicians were much more likely to be located in large and small metro areas than in rural counties.
- Generalist physicians, obstetrician/gynecologists and general surgeons were more evenly distributed across geographic areas, with family practitioners and general practitioners distributed most evenly relative to the population.
- Despite the growing increase in the number of female physicians, women were substantially less likely than males to locate their practice in a rural area.
- The geographic distribution of women physicians was uneven across the states relative to men, with generalist male to female ratios higher than 10:1 in some states and lower than 3:1 in others.
- The Northeast had the highest rate of generalist physicians per 100,000 population but also the largest gap between urban and rural rates.
- The lowest supply of generalists was in the rural South where the ratio of generalists to population was 45/100,000 although the West had a comparable ratio of 56/100,000, with the narrowest rural/urban difference (56 vs. 76/100,000).

Pathman, Donald E., Thomas R. Konrad and Thomas C. Ricketts. (1994). "Medical education and the retention of rural physicians." *Health Services Research* 29(1) April: 39-58.

Summary

This prospective cohort study assessed whether or not retention in rural practice settings was longer for graduates of public medical schools, community hospital-based residency programs and for those who participated in a rural rotation as a medical student or resident. Physicians serving in the National Health Service Corps (NHSC) placement were included in the analysis.

Key Findings

- Of the rural physicians not fulfilling a NHSC commitment, retention in a rural practice did not differ between graduates from a public or private medical school; whether they trained in a community hospital or academic medical center or completed a rural rotation as a medical student or resident.
- Of physicians fulfilling a NHSC commitment, there was no difference in retention rates between physicians with a rural experience as a medical student or resident and those trained in community hospital residency program.
- Contrary to common wisdom, public medical school graduates in a NHSC site remained in the rural area for shorter periods than private medical school graduates.

Rural Health Research Center (2007). 2005 physician supply and distribution in rural areas of the United States. Seattle: RHRC: I-22.

Summary

This study was based on an analysis of data from the 2005 Master Files of the American Medical Association and American Osteopathic Association of clinically active, non-residency, non-federally employed physicians aged 70 or younger. The purpose of the study was to examine the supply and distribution of physicians with a particular emphasis on generalists in rural areas. The role of osteopaths (DOs) and international medical graduates (IMGs) was also considered.

Key Findings

- There is an uneven rural-urban distribution of physicians with wide variation among rural locations around the country.
- Generalists were the mainstay of physicians practicing in rural areas; this was more exaggerated as ruralness increased.
- The specialist-to-population ratio decreased as geographic areas become smaller and more isolated.
- In 2004, approximately 88% of U.S. physicians practiced in urban areas and 80% of the U.S. population resided in an urban area. In contrast, rural areas contained 19 % of the population but only 11% of the physician workforce.
- Of the three major primary care specialties, family medicine was most prevalent in rural areas, representing 50% of all physicians practicing in small rural or isolated areas.
- The New England states had the highest generalist-to-population ratio in rural areas (85.9/100,000).
- DOs were more likely than MDs to be generalists (57.5% vs. 34.8%) and to practice in a rural area (18.5% vs. 11.0%). Generalist DOs were more likely to practice in small and isolated rural areas than were MDs, but were less likely to practice in high poverty areas.
- The delivery of rural primary care was often stressed in osteopathic schools with required rural clinical rotations.
- Among all primary care physicians, IMGs were more likely than U.S. medical school graduates to be generalists (41.2% vs. 34.4%). IMGs made up almost 20% of the rural primary care workforce

(although less than 6% of rural generalist physicians in Colorado at the time of this analysis were IMGs).

- For family medicine and general pediatricians, the more rural the practice location, the older the physician.
- Among rural generalists, women were slightly less likely than men to practice in a small rural area (27.7% vs. 30.3%) or in a high poverty area (9% vs. 10%).
- Women were also less likely to be board certified as a family medicine physician (54.3% vs. 62.9%) or general internist (23.3% vs. 28.7%) but were two and-one-half times more likely to be certified as a general pediatrician (22.5% vs. 8.4%).
- The family medicine-to-population ratio in all rural areas was higher in places where travel time was 60 minutes or more to the nearest urbanized areas and was almost always higher than in urban areas.
- Nationally, approximately one-third of physicians were generalists, yet in rural areas the proportion of generalists was close to 50%.
- Other factors influencing the slowing of the flow of primary care physicians to rural areas included large reductions in Title VII funding for primary care training; post 9/11 changes in visa and immigration requirements that make it more difficult to enter and practice medicine in the United States and proportional increases in H-1B and decreases in J-1 visas.

Shi, Leiyu, et al. (1998). "Physician practice characteristics and satisfaction: A rural-urban comparison of medical directors at U.S. Community and Migrant Health Centers." *The Journal of Rural Health* 14(4) Fall: 346-56.

Summary

Using data from a 1996 cross-sectional survey of Community and Migrant Health Center (C/MHC) medical directors; this study examined the associations between physician practice characteristics and satisfaction of medical directors at rural and urban C/MHCs.

Key Findings

- The majority of medical directors (82.3%) were satisfied with their work.
- Satisfaction with work was most significantly associated with overall level of satisfaction, followed by satisfaction with administration, peers and patients.
- Recruitment efforts were more likely to succeed when they targeted individuals with prior experience in an underserved area.
- Growing up in an inner-city community was significantly associated with practicing in an urban C/MHC.
- Growing up in a rural or frontier community was significantly associated with practicing in a rural C/MHC.
- 88% of the medical directors were medical doctors (MD), 6.8% were doctors of osteopathy (DO), and the rest were from a variety of other health care backgrounds (nurse practitioners, physician assistants, dentists, etc.).
- African-American medical directors were more likely to work in an urban C/MHC than in a rural one (22.4% in urban vs. 10.1% in rural).
- A significantly greater proportion of rural medical directors were white (70.9% in rural vs. 60.6% urban).
- Osteopathic physicians (8.8% rural vs. 4.15% urban) were more likely to serve as medical directors in a rural as opposed to a urban setting.
- Rural medical directors were more likely to be married than their urban counterparts (85.7 vs. 80.6%).

- Approximately the same percentage of rural and urban medical directors was board certified in their specialty area.
- The proportion of general and family practice physicians was greater in rural (69%) than urban (44.3%) C/MHCs.
- The proportion of internists (28.1% urban vs. 12.2% rural) and pediatricians (19.2% urban vs. 10% rural) was greater in urban C/MHCs.

5. What is the practice capacity of physicians practicing in a rural area to add new patients or modify their payer mix?

Azeltine, Robert H., and Matthew C. Katz. (2008). "Connecticut Physician Workforce Survey 2008: Initial findings on physician perceptions and potential impact on access to medical care." *Connecticut Medicine* 72(9) October: 539-49.

Summary

This study used a self-administered mail survey to identify problems associated with the supply of physicians in certain medical specialty areas in Connecticut and to examine root causes as well as assess their impact on patients' access to care.

Key Findings

- Nearly 20% of physicians across all specialty areas reported that they were contemplating a career change because of their practice environment. Negative components of the practice environment included financial pressures, the demands of new technology (such as electronic medical records), medical liability issues and contemplated reforms to the health care system.
- Many respondents reported reducing their practice capacity. Overall, 33% of physicians reported they had reduced the number of high-risk patients they saw over the past three years and 38% of physicians reduced the number of high-risk procedures they performed.
- 48% of respondents reported that obtaining a referral or consultation for their patients had become increasingly difficult over the past three years. 90% of emergency department physicians and 72% of pediatricians reported increasing difficulty in obtaining referrals.
- The most common reasons cited for difficulty in obtaining referrals were health plan restrictions, the supply of physicians in some specialty areas and reimbursement rates.
- 35% of physicians responding reported that filling physician vacancies in their specialty areas was "very difficult" and 47% reported "somewhat difficult."
- 65% of respondents said that physician retention had stayed the same over the past three years, while 31% reported that staff retention had worsened.
- Baldwin, Laura-Mae et al. (1999) "Rural and urban physicians: Does the content of their Medicare practices differ." *The Journal of Rural Health* 15(2): 240-51.

Summary

This study used 1994 Medicare claims data from Washington State to examine whether differences in the availability of medical technology, the structure of a medical practice and characteristics of patient populations were associated with variation in the content of practice between physicians practicing in rural and urban areas. The study compared the number of patients, outpatient and inpatient visits, diagnosis clusters, patient age and sex and procedure frequency by board-certified rural and urban physicians in 12 ambulatory care medical specialties.

Key Findings

- Rural physicians saw larger numbers of elderly patients and had higher volumes of outpatient visits than urban physicians.

- The most notable finding was similarity in the diagnoses seen in rural and urban practices in all specialty groups in both outpatient and inpatient settings. Rural-based physicians were generally specialty-specific except for general surgeons and OB/GYNs where rural general surgeons had more visits for gastrointestinal disorders and rural OB/GYNs had more visits out of their specialty area for such diagnoses as hypertension and diabetes.
- A large proportion of the procedures performed by family physicians in rural areas were dermatologic-related (49.8%).
- Rural physicians in almost every specialty saw more patients per physician and had higher numbers of outpatient visits per physician compared to urban physicians.
- Rural family physicians and general internists had twice as many outpatient visits per physician as their urban counterparts.

Rosenblatt, Roger A. et al. (2006). "Shortages of medical personnel at Community Health Centers: Implications for planned expansion." *The Journal of the American Medical Association* 295(9) March: 1042-49.

Summary

This examined the status of workforce shortages limiting community health center (CHC) expansions through a survey that was conducted between May and September 2004 of all 846 federally-funded CHCs within the 50 states and the District of Columbia.

Key Findings

- Primary care physicians made up 89% of physicians working in CHCs, with the majority being family physicians.
- Rural CHCs had a higher proportion of vacancies and longer-term vacancies and reported greater difficulty filling positions compared with urban CHCs.
- More than one-third of rural CHCs had been recruiting for a family physician for seven or more months.
- Physician recruitment in CHCs was heavily dependent upon National Health Service Corps scholarships, loan repayment programs and international medical graduates with J-1 visa waivers. Of these programs, loan repayment was the most frequently used (14.5% of CHC physicians were enrolled in federal or state loan repayment programs). Of the current rural physician staff in CHCs, 44% were enrolled in one of these repayment programs, almost twice as great as the percentage of urban physician enrollment. 37% of rural CHCs currently have physicians with J-1 visa waivers.
- Major barriers to recruitment as reported by respondents included low salaries, cultural isolation, poor-quality schools and housing and lack of spousal job opportunities.
- The largest numbers of unfilled positions were for family physicians.
- An increase in minority medical education graduates was reported to have a significantly positive effect on urban but not rural CHCs.

6. Do physicians practicing in a rural area differ from their urban counterparts in terms of hours worked or retirement plans?

Baldwin, Laura-Mae, et al. (1999) "Rural and urban physicians: Does the content of their Medicare practices differ." *The Journal of Rural Health* 15(2): 240-51.

Summary

This study used 1994 Medicare claims data from Washington State to examine whether differences in the availability of medical technology, the structure of a medical practice and characteristics of patient

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- Rural physicians in almost every specialty saw more patients per physician and had higher numbers of outpatient visits per physician compared to urban physicians.
- Rural family physicians and general internists had twice as many outpatient visits per physician as their urban counterparts.
- Family physicians were most likely to practice in rural areas (25.1%).
- Psychiatrists (4.8%), cardiologists (6.2%) and gastroenterologists (7.9%) were least likely to practice in rural areas.

Hart, Gary, et al. (2002). "Rural health care providers in the United States." *The Journal of Rural Health* 18(5) Supplemental: 211-32.

Summary

This literature review identifies the challenges for rural health researchers and policymakers with regard to estimating health care provider supply. Physician supply, geographic and specialty distribution, age, gender, quality of care, recruitment and retention, training, productivity and income, reimbursement and managed care, federal and state ameliorative programs, safety net and telehealth were each discussed.

Key Findings

- Contrary to common belief, rural family practitioners and general practitioners did not have lower average incomes than their urban counterparts.
- Substantial variations in rural physician incomes were evident from the data.
- The income potential of rural physicians was limited by a small population base, low reimbursement levels in public programs, low levels of insurance coverage and large discounts negotiated by insurance carriers.

Luman, Kyle, John Zweifler and Kevin Grumbach (2007). "Physician perceptions of practice environment and professional satisfaction in California: From urban to rural." *The Journal of Rural Health* 23(3) Summer: 222-27.

Summary

This study analyzed a self-administered questionnaire of 2,240 primary care and specialist physicians identified from the American Medical Association's California Physician Master File administered between 2001- 02. The purpose of the study was to better understand the differences between rural and urban physician' perceptions of their practice environment.

Key Findings

- Primary care physicians practicing in a rural area defined as nonadjacent or small non-metropolitan counties were the least likely to report pressures to see more patients, limit referrals and limit treatment options.
- Specialists in rural areas that are within a metropolitan area (or in large adjacent non-metropolitan counties) were more likely than urban specialists to report practice pressures.
- Although rural physicians in primary care and specialties reported difficulty in attracting new physicians to their community, they also reported a better practice climate overall than their urban counterparts.
- Physicians in the nonadjacent or small non-metropolitan category were the most satisfied while specialists in the nonadjacent or small non-metropolitan category were the least satisfied with their practice environment.
- Among primary care physicians, family physicians were the most likely to practice in a rural area (29% of urban and 55% of rural primary care physicians).

Weeks, William B., and Amy E Wallace (2008). "Rural-urban differences in primary care physicians' practice patterns characteristics and incomes." *The Journal of Rural Health* 24(2): 161-169.

Summary

This study examined rural-urban differences after adjusting for observed differences in physician work effort, physician characteristics and practice characteristics to determine whether rural primary care physicians' incomes were lower than those of urban primary care physicians. The analysis included actively practicing office-based general practitioners (1,157), family physicians (1,378), general internists (2,811) and pediatricians (1,752) who responded to the American Medical Association's annual survey of physicians between the years 1992-2002 (AMA Master File).

Key Findings

- Rural primary care physicians' unadjusted annual incomes were similar to their urban counterparts, but they tended to work longer hours, had more patient visits and had a much greater proportion of Medicaid patients.
- After adjusting for rural-urban differences, the analysis revealed that rural physicians were paid about 5% less than urban physicians. Incomes of general internists and pediatricians were particularly lower after adjustments.
- Findings suggested that even modestly lower incomes negatively affected the decision of physicians to practice in a rural area, largely due to medical school debt.
- Compared to urban physicians, rural primary care physicians were more likely to own the practice (statistically significant for all specialties except general internal medicine), less likely to be female (for all specialties except pediatrics) and equally likely to be board certified.
- Rural general practitioners and family physicians were more likely to be White and less likely to be international medical school graduates.
- Rural physicians saw approximately one-and-a-half times more Medicaid patients than urban physicians.
- Board certification was associated with higher annual incomes.
- Female gender was associated with lower annual incomes.
- International medical school graduates were more likely to have higher incomes than U.S. medical school graduates.
- A greater proportion of Medicaid patients were associated with lower annual incomes.

Humphreys, John S., et al. (2002). "Workforce retention in rural and remote Australia: Determining the factors that influence length of practice." *Medical Journal of Australia* 176 (May):472-476.

Summary

A national survey of a stratified sample of all rural general practitioners (GPs) practicing during April-June 2001, to identify which factors were most significant in a general practitioner's decision to stay in rural practice and whether these retention factors varied in importance according to the geographical location of the practice and GP characteristics.

Key Findings

- In general, factors affecting retention and turnover fell into three broad categories: professional issues; social factors relating to personal and family considerations; and external factors related to the community and its geographical location.
- Professional considerations, mostly on-call arrangements, were found to be the most important factor determining general practitioner retention in rural and remote areas. Rural physicians consistently ranked on-call arrangements, professional support and variety of practice as the top three issues related to retention. The local availability of services and geographical attractiveness were two subsidiary considerations.
- Proximity to a city or large regional center was the least important factor.

Pathman, Donald E., Thomas R. Konrad and Christopher R. Agnew. (2003). "Predictive accuracy of rural physicians' stated retention plans." *The Journal of Rural Health* 19(3) June: 236-244.

Summary

This study tested the predictive accuracy of rural physicians' stated retention plans as well as the hypothesis that predictions are more accurate for certain physicians, such as those with more experience who have more control over their work situation and therefore at less risk for job burnout. A 1991 mail survey questioned rural physicians about their retention plans and a 5-6 year follow-up survey determined if and when the respondents had moved.

Key Findings

- Individual predictions were moderately accurate.
- 4 of 5 physicians who predicted they would remain in their practice at least five years did so.
- 2 of 3 physicians who predicted remaining less than five years left within the five year period.
- Predictions of a job change within two years tended to be more accurate than predictions of a change within two to five years.
- Physicians' predictions were more accurate when they worked in practices they owned and were on call two or fewer times per week.
- Two main factors predicted physicians' leaving their practice earlier than anticipated were working in a practice owned by others and being on call three or more times per week.
- Retention predictions were no more accurate for those who had more practice experience on any of the measures tested.
- Physicians working in areas with lower than average per capita incomes were more likely to leave earlier than they had previously anticipated.

7. Are there unique reimbursement issues that affect physicians practicing in a rural area with regard to Medicaid and Medicare?

Fryer, G.E. et al. (1998). "Personal and educational background predictors of physician practice profiles: The case of Colorado." *Evaluation and Programming Planning* 21: 307-314.

Summary

Using a statewide survey sent out with 1995 licensure renewals, this study assessed the professional practice profiles for 5,767 Colorado physicians who had completed a residency training program. The purposes of the mailed survey were to: 1) evaluate the contribution of Colorado's undergraduate and graduate medical education programs to recruitment of physicians within the state; and 2) assess the relationship between practice profiles and physicians' demographic and other background variables. The goal of the assessment was to better understand the factors that should be considered in evaluating applications for medical school and /or residency program admissions.

Key Findings

- Female physicians were more likely to choose a primary care specialty, while male physicians were more likely to serve Medicaid patients.
- Minority physicians were overrepresented among generalists, provided more direct patient care (50 hours/week) and were more willing to provide care to Medicaid patients (88.7%) than other physicians included in the analysis.
- Male physicians spent more hours weekly in direct patient care than did female physicians within each ethnic group reported.
- Only female Asian physicians served more Medicaid patients than their male counterparts (89.6% vs. 84.2%).
- A large majority of physicians reported serving Medicaid patients, but only half were accepting new Medicaid patients.

Hart, Gary, et al. (2002). "Rural health care providers in the United States." *The Journal of Rural Health* 18(5) Supplemental: 211-32.

Summary

This literature review identified the challenges for rural health researchers and policymakers with regard to estimating health care provider supply. Physician supply, geographic and specialty distribution, age, gender, quality of care, recruitment and retention, training, productivity and income, reimbursement and managed care, federal and state ameliorative programs, safety net and telehealth were each discussed.

Key Findings

- Medicare and Medicaid reimbursement policies had a profound influence on many rural physicians because they represented, on average, half of rural physicians' incomes.

Mueller, Keith J., et al. (2004). "Rural physicians' acceptance of new Medicare patients." Rural Policy Research Institute (RUPRI) Center for Rural Health Policy Analysis Rural Policy Brief 9(5): 1-7.

Summary

This policy brief reviewed published studies, national surveys and in-house (RUPRI) to describe the trends among urban and rural physicians who no longer accepted new Medicare fee-for-service patients.

Key Findings

- The percentage of rural and urban family physicians accepting Medicare patients declined from 84% in 2000 to 76% in 2003, the decline coinciding with projected annual decreases in Medicare physician payment announced in March 2002 and March 2003.
- The percentage of Medicare beneficiaries (from a national household survey) stating that they could not get an appointment *soon enough* grew from 13.9% in 1997 to 23.6% in 2001.
- Reports of physician practices not accepting new Medicare patients have been especially dramatic in Colorado and Washington State.
- The decline was occurring more slowly in rural areas where rural physicians are often the only source of health care for the community and therefore they are less likely to turn patients away. Physicians practicing in rural areas not adjacent to an urban area were most likely to accept new Medicare patients.
- The biennial Community Tracking Study (CTS) Physician Survey conducted by the Center for the Study of Health System Change and the annual survey of family practice physicians conducted by the American Academy of Family Physicians (AAFP) supported the finding that physicians increasingly were not accepting new Medicare patients. These surveys found that the percentage of all physicians (excluding pediatricians) not accepting any new Medicare patients increased modestly from 4.9% in 1996-97 to 6.1% in 2000-01 (CTS) and that among family practice/general practice physicians in 2000-01, 10% reported not accepting any new Medicare patients (CTS).
- An Internet-based survey of key informants (state offices of rural health, state medical associations and state chapters of the AAFP) conducted by RUPRI revealed that insufficient payment was the most common reason cited for not accepting new Medicare patients.

BBC Research & Consulting. (2003). Colorado Association of Family Medicine Residencies Survey of Medicare participation. Denver: BBC Research & Consulting: 1-11.

Summary

This report presented findings from a telephone survey of Colorado primary care physicians conducted between November 2002 and March 2003 following a concern of the Colorado Association of Family Medicine Residencies about Medicare patients' access to primary care. The survey estimated the proportion of Colorado primary care physicians who cared for Medicare patients and the share who were accepting new Medicare patients.

Key Findings

- Of the primary care physicians who were not required to accept Medicare, approximately 57% cared for outpatient Medicare patients, but only 34% were accepting new Medicare patients.
- 31% of primary care physicians reported accepting Medicare HMO with only 20% of these physicians accepting new Medicare HMO patients.
- Very few physicians dropped current patients once they became eligible for Medicare coverage.
- Feedback from primary care physicians suggested that reimbursement was a key issue affecting their willingness to accept Medicare patients.
- Physicians with Medicare practices that represented a relatively small proportion of their overall practice (10% or less) tended to be younger and located in urban areas.
- Family practice physicians were more likely than internal medicine physicians to report having a small proportion of Medicare patients.

Pathman, Donald E. et al. (2000). "Medical training debt and service commitments: The rural consequences." *The Journal of Rural Health* 16(3) Summer: 264-272

Summary

This study assessed how student loan debt, scholarships and loan repayment programs with service requirements affected a physician's decision to pursue higher income practices in non-rural settings and limit or refuse to accept Medicaid and/or uninsured patients. Data were collected from a 1999 mail survey of a national probability sample of 468 practicing family physicians, general internists and pediatricians who graduated from U.S. medical schools between 1988 and 1992. The study further investigated how educational costs influenced primary care physicians' participation in loan repayment programs and how these programs affected their practice location, income and the patients seen in their practice.

Key Findings

- In their first job after residency, family physicians and pediatricians with greater debt reported caring for more Medicaid or uninsured patients than physicians with less debt.
- Physicians in loan repayment programs provided more care to Medicaid and uninsured patients when compared to those without obligations (53% vs. 29%).
- The high cost of medical education is directly related to participation in federal and state loan repayment programs that require service in a medically underserved area, thus, national workforce goals partially get met through these financial incentive strategies.

8. What are rural physicians' attitudes with regard to specific health policy issues such as scopes of practice of allied health professionals, health care reform proposals, pay for performance, HIT and telehealth?

Azeltine, Robert H., and Matthew C. Katz (2008). "Connecticut Physician Workforce Survey 2008: Initial findings on physician perceptions and potential impact on access to medical care." *Connecticut Medicine* 72(9) October: 539-49.

Summary

This study used a self-administered mail survey to identify problems associated with the supply of physicians in certain medical specialty areas in Connecticut and to examine root causes as well as assess their impact on patients' access to care.

Key Findings

- Nearly 20% of physicians across all specialty areas reported that they were contemplating a career change because of their practice environment. Negative components of the practice environment included financial pressures, the demands of new technology (such as electronic medical records), medical liability issues and contemplated reforms to the health care system.
- Many respondents reported reducing their practice capacity. Overall, 33% of physicians reported they had reduced the number of high-risk patients they saw over the past three years and 38% of physicians reduced the number of high-risk procedures they performed.
- 48% of respondents reported that obtaining a referral or consultation for their patients had become increasingly difficult over the past three years. 90% of emergency department physicians and 72% of pediatricians reported increasing difficulty in obtaining referrals.
- The most common reasons cited for difficulty in obtaining referrals were health plan restrictions, the supply of physicians in some specialty areas and reimbursement rates.
- 35% of physicians responding reported that filling physician vacancies in their specialty areas was "very difficult" and 47% reported "somewhat difficult."
- 65% of respondents said that physician retention had stayed the same over the past three years, while 31% reported that staff retention had worsened.

Bahensky, James A., Mirou Jaana and Marcia M. Ward (2008). "Health Care Information Technology in rural America: Electronic medical record adoption status in meeting the national agenda." *The Journal of Rural Health* 24(2): 101-105.

Summary

This literature review about health information technologies (HIT) in rural settings was undertaken to add insight into the status of and barriers to HIT implementation in rural areas.

Key Findings

- The level of IT capacity, including electronic medical records (EMRs), is limited in most clinical settings and varies significantly between urban and rural areas.
- Current estimates indicate that only 18% of all hospitals and 15% of ambulatory clinics have adopted EMRs, with lower percentages observed in rural areas.
- Nearly 50% of small (fewer than 5 physician) practices do not have plans to implement an EMR in the next two years.
- Two major organizational factors that significantly affect the adoption of HIT in rural settings are size of the organization and the lack of clinical and technical human resources trained in HIT adoption. Further, it is difficult to make the initial investment in the systems and to sustain the implementation of EMRs.
- The estimated loss per physician productivity in EMR adoption in a solo or small group practice is \$6,000-\$12,000 due to lost productivity during the EMR start-up period.
- The size, system affiliation and for-profit status of a hospital are all positively associated with HIT adoption.
- System affiliation played a significant role on the level of EMR adoption among small hospitals, but not among medium or larger hospitals.
- Financial barriers presented significant concerns to health care providers.

Chen, Li-Wu, and Anne Skinner (October 2008). "Electronic Health records adoption: Rural providers' decision-making process." Rural Policy Research Institute (RUPRI) Center for Rural Health Policy Analysis Rural Policy Brief 4. Retrieved November 3, 2008, from www.unmc.edu/ruprihealth.

Summary

Through several 90-minute site visits and interviews of two rural hospitals in Nebraska, this study examined the decision-making process that officials of small rural physician clinics and hospitals use as they started the process of selecting an electronic health record (EHR) system.

Key Findings

- The major challenge to the implementation of EHRs for these rural health care providers was the complexity associated with the selection and adoption process which included a lack of knowledge about EHR systems and the industry, uncertainty about cost and doubts about the quality of information presented by vendors.
- Rural providers' main rationale for implementing an EHR system was to increase their organizational efficiency at reducing the turnaround time for payment, reducing or eliminating transcription costs, reducing time spent on paper-charting, reducing the space needed for chart storage, increasing staff availability for other tasks and increasing staff job satisfaction.
- Hands-on experience with EHR systems and relationships with associated vendors were the main factors that ultimately triggered providers' final decision about which system to adopt.

Culler, Steven D., et al. (2006). "Urban-rural differences in the availability of hospital information technology applications: A survey of Georgia hospitals." *The Journal of Rural Health* 22(3) Summer: 242-47.

Summary

A mail survey to community hospitals in Georgia was administered to determine if there were significant differences between urban and rural community hospitals in the availability of selected IT functional applications and technological devices.

Key Findings

- Compared to rural hospitals, urban hospitals had significantly more functional applications computerized (38% vs. 31.8%) and technological devices available (23.9% vs. 18.2%).
- Urban hospitals had significantly more IT applications available in emergency room services, surgical operating rooms, laboratories and radiology.
- More than 40% of urban hospitals had adopted over 70% of all IT applications available, while approximately 26% of rural hospitals had adopted less than 30% of these applications.
- There was significant concern about the ability of selected rural hospitals to take advantage of regional data-sharing initiatives and maintain quality of patient care in the future.

Hart, Gary, et al. (2002). "Rural health care providers in the United States." *The Journal of Rural Health* 18(5) Supplemental: 211-32.

Summary

This literature review identified the challenges for rural health research and policy regarding health provider supply. Physician supply, geographic and specialty distribution, age, gender, quality of care, recruitment and retention, training, productivity and income, reimbursement and managed care, federal and state ameliorative programs, safety net and telehealth are discussed.

Key Findings

- Medicare and Medicaid reimbursement policies had a profound influence on many rural physicians because they often represented half of rural physicians' incomes.
- Few private and governmental medical care payers provided reimbursement for telehealth services, with the exception of radiology and pathology.

QUESTIONS 9-11 HAVE BEEN ADDRESSED IN THE PREVIOUS ARTICLE REVIEWS

- 9. Are spousal considerations important in recruitment and retention incentives offered to physicians considering a rural practice?**
- 10. What community roles (e.g., county commissioner, school board member) or others outside of clinical practice influence retention?**
- 11. What are successful community and/or employer recruitment and retention incentives (e.g., loan repayment, housing subsidy, longevity bonus, flex schedule and regular locum tenens support) for rural physicians?**