Louisiana Interagency Task Force on

THE FUTURE OF FAMILY MEDICINE

Report to the...

Secretary of the Department of Health and Hospitals and the House and Senate Committees on Health and Welfare

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LOUISIANA INTERAGENCY TASK FORCE ON THE FUTURE OF FAMILY MEDICINE

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Executive Summary

The Louisiana Interagency Task Force on the Future of Family Medicine was created by Senate Bill 484 in the 2004 Regular Session of the Louisiana Legislature to assist the Department of Health and Hospitals in studying and finding strategies to eliminate the significant health care shortages in the State. The Task Force was charged specifically with looking at physician workforce needs as related to Family Physicians, the generalist discipline that provides more primary care in the U.S. then any other discipline. The Task Force focused initially on the need in rural areas where the lack of access to primary health care is particularly acute. Post Katrina, it has broadened its scope in recognition of the generalizable nature of its findings regarding the value of primary care delivered by family physicians to the needs in urban underserved areas as well and regarding strategies to enhance the production of family physicians for Louisiana .

The Task Force met regularly since 2004, including twice since Katrina, with numerous phone and e-mail interactions between meetings. Through extensive discussion by Task Force members and utilizing a review of the literature and available data, the Task Force notes the following characteristics of Louisiana's healthcare system:

- Louisianans' *limited access to local, community based primary medical care and preventive services,* which is particularly acute in the many rural and urban areas of the State, is a significant contributor to the State's long standing low overall health ranking of 49th or 50th.

- *Ninety-seven percent of Louisiana parishes* after Hurricanes Katrina and Rita have areas classified as *Primary Care Health Professional Shortage Areas* (HPSAs)

- Less than one-third of all Louisiana physicians specialize in primary care, making Louisiana *38th in the country for primary care physicians*, despite ranking 10th in per capita production of physicians. Additionally, *the current primary care work force is aging, less then 10% of new graduates of Louisiana medical schools are entering Family Medicine, and over half of new Louisiana Family Medicine residents are international medical graduates* which raises concerns about their retention in needed areas.

- *Community Health Centers* (CHCs), which are expanding in Louisiana and are proposed in Post-Katrina New Orleans and nationwide as a key strategy for medically under served communities, are *predominantly dependent on family physicians*. A short supply of family physicians for CHCs nationwide and in the State already exists, particularly in rural areas.

- Louisiana ranks *highest in the U.S. in per capita Medicare expenses, yet lowest in quality measures*, and has *the second highest per capita spending on hospital costs in the nation.*

The Task Force also reviewed a growing body of compelling evidence which strongly supports *the benefit of primary medical care to a population's health. In particular, our review clearly demonstrates that:*

- States and, across the world, nations with proportionately more *primary medical care* providers have *better quality indicators and lower per capita expenditures.*

- An increase of primary care doctors for a population is independently associated with *lower mortality, particularly in minority populations*.

- A small increase in the relative number of generalist physicians in a state is associated with a significant boost in that state's quality ranking.

- Investing in primary care physicians has an important economic impact to a community as well. The income that comes into a community due to the presence of *one* family physician impacts the economic health of the area by approximately $1.2 million in rural areas, and $0.9 million in urban areas.

- Family physicians are the medical discipline most distributed like the population of the country, best suited for the diversity of services required in rural practice, and by far most likely - over 8 times more likely then any other medical discipline - to enter rural practice.

- Family physicians are the predominant usual source of care for the Medicare population in the United States, particularly underserved minority populations and those living in rural areas. [Graham Center, 2002).

- Despite the evidence supporting the value of adequate numbers, accessibility and distribution of family physicians to the health of the population, a persistent, multi-year trend in the choice of specialty training by U.S. medical students threatens the adequacy of the primary care physician workforce of the United States. [Graham Center, 2003).

The Task Force offers the following conclusions and recommendations.

Task Force Conclusions:

- There are clear benefits to population health when there are more generalist physicians. This is especially true for minority populations.
- Any effort to address rural workforce deficiency must focus on Family Medicine as the key medical discipline.

- Since Katrina, the primary care workforce gap in the New Orleans has been exposed, and may best be met substantially with family physicians.

- The health care literature demonstrates successful strategies to increase entry into Family Medicine as a specialty. Medical schools must focus on admitting the “right” candidate and must facilitate and maintain a focus on Family Medicine with curriculum, mentoring and financial support.
- Some of the lowest cost work force solutions to increasing the Family Medicine workforce (e.g., selective admissions policies in medical schools) are the most effective strategies.

- The "pipeline" for placing a family physician into a community is long - starting with recruiting, admissions to medical school, then residency training, and finally placement and hopefully long term retention and

integration into a rural community for practice. Attention must be paid to *each* part of the pipeline and results can not be expected instantaneously.

Existing forces and arrangements have resulted in the current specialty and geographic maldistribution of physicians in the State. All too often, the traditional approaches to work force solutions are short term and hence expensive (e.g., J1 visa physicians) or focused on narrow program interests rather then on overall population need. The Post-Katrina primary care workforce gap in Region I is particularly illustrative of the consequence of a lack of planning. The Task Force believes that *purposeful policy and strategy decisions must be made with the long term and the health of the state's population in mind* and then evaluated and sustained if we as a State are to successfully redirect and sustain each component of the primary medical care work force pipeline.

To that end, the work of the Task Force is not complete. We believe that our findings will have very important implications for State policy, and that the work of the Task Force needs to be continued to allow generation of specific recommendations and a plan for follow-up and evaluation of those plans.

The findings of the Task Force make it clear having a physician work force with adequate numbers of geographically well distributed primary care physicians is a vital component of a plan to improve the overall health status of the population while simultaneously lowering costs and improving quality. Specifically, increasing the number of family physicians for the State is essential for any successful strategy that is designed to improve citizens' access to care,especially in rural areas of the State and in the New Orleans metropolitan area, and where growth of Community Health Centers is likely to be targeted.

Task Force Recommendations:

The Task Force makes the following recommendations.

In order to assure a vibrant, high quality and appropriately distributed primary care workforce for the State of Louisiana, the following recommendations are put forth:

1. ***Establishment of a Commission or Task Force on Family Medicine with longevity, to oversee a longitudinal process of analysis, policy development, fiscal responsibility in awarding of scholarships, and implementation of policy.***
2. ***Collaboration with community entities, including the Louisiana Area Health Education Centers (AHECs), in identifying and mentoring students headed for primary care careers.***
3. ***Creation of selective admissions practices into medical school for students who are most likely to practice in underserved areas.***
4. ***Increasing exposure to Family Medicine, and explicitly to include rural Family Medicine, during medical school at each level (e.g., during each year).***

5. *Exploring and developing financial incentives and support for students to train in rural Louisiana and primary care sites such as Community Health Centers (CHCs).*
6. *Assuring that the state's Family Medicine Residencies have adequate capacity and resources to address state need, are appropriately geographically distributed, and are sustained at the highest quality.*
7. *Exploring and developing financial incentives for physicians to practice and remain in rural areas.*
8. *Creation of an ongoing entity charged with physician work force planning and policy.*
9. *Longitudinal data collection for workforce planning and evaluation of programs.*
10. *Ensure that the Healthcare Redesign Collaborative is made aware of the Task Force's Final Report.*

Introduction:

The Louisiana Interagency Task Force on the Future of Family Medicine was created by Senate Bill 484 in the 2004 Regular Session of the Louisiana Legislature to assist the Department of Health and Hospitals and other appropriate health and human service agencies in studying and finding strategies to eliminate the significant health care shortage, especially in rural and inner city areas, manifested as a lack of access to primary health care, especially care delivered by family physicians. (Please see Appendix A for definitions of Family Medicine and Primary Care).

The Task Force was organized and met in September and November 2004, January, March, and May 2005, and January and March 2006, and in between meetings via numerous conference calls and e-mails, to evaluate its charge and develop and report recommendations to the Legislature. The Task Force studied issues related to promoting student interest in rural and inner city health care careers, examined predictors of and programs aimed at identifying prospective medical students who ultimately practice Family Medicine, identified state and federal education or training grants, loans and scholarships which could apply or be amended to apply to medical and residency students, and examined programs from states that could be duplicated in Louisiana and have been successful in encouraging physicians to set up practice in rural areas. Task Force members completed a web-based survey in order to prioritize focal areas. Results are presented in Appendix B.

Status of Health in Louisiana:

The United States ranks 12th of 13 industrialized countries studied for 16 different health indicators (Starfield, 1998). Louisiana ranks in the bottom five states (United Health Foundation, 2004) on six of 18 measures used to assess the overall healthiness of each state and ranks in the bottom 10 states for an additional six indicators of health. Louisiana ranks 50th for the combined measures of risk factors and 49th for the combined measures of outcomes (United Health Foundation, 2004). Among other reasons for such a poor ranking, ***Louisianians have limited access to primary medical care*** (PriceWaterhouseCoopers, 2006).

Louisiana has the second highest per capita spending on hospital costs and the highest Medicare spending per recipient in the nation. Yet, measures of quality of care place Louisiana 50th among the states (Baicker & Chandra, 2004). In their article summarizing Medicare spending, physician workforce, and quality of care across the 50 states, Baicker and Chandra conclude that higher spending is significantly associated with lower quality of care, often because expenditures are focused on more expensive hospital or institutional care and subspecialty care rather than on primary care. In discussing the implications of these results, Baicker and Chandra conclude that ***encouraging greater access to primary care physicians could improve the overall quality of care received by the elderly population while lowering costs.***

A lack of training physicians in Louisiana has not been the issue (PriceWaterhouseCoopers, 2006). Louisiana graduates 9.7 physicians per 100,000 persons residing in the state. This is the 10th highest rate in the country. Yet, ***less than one-third of all Louisiana physicians specialize in***

primary care, making Louisiana 38th in the country for primary care physicians. Additionally, primary care physicians in the state are aging, with one-quarter of all Family Physicians in Louisiana at least 60 years of age. The outcome resulting from these statistics is that 25% of our population lacks access to primary care.

The scarcity of primary care physicians was further exacerbated by the recent natural disasters. ***Following Hurricanes Katrina and Rita, 97% of Louisiana parishes have areas classified as Primary Care Health Professional Shortage Areas (HPSAs)*** (DHH, 2006). Eighty-nine percent of Louisiana parishes were classified as Primary Care HPSAs prior to the two devastating hurricanes. Despite 20 years of increasing physician supply, the percent of physicians practicing primary care and the proportion of physicians practicing in rural areas relative to urban areas have both declined significantly. As stated above, the consequences of diminished access to primary care are higher costs and lower quality outcomes.

<u>Status of Medical Education in Louisiana:</u>

While Louisiana is strong in the overall numbers of physicians who train in the state, entry into primary care, specifically Family Medicine, and into rural practice has lagged. In response, the medical schools with the leadership of their Departments of Family Medicine have begun a limited scope of initiatives designed to increase the number of physicians who will practice in rural areas of the state.

Since the early 1990's LSUHSC in New Orleans and Shreveport, as well as Tulane School of Medicine since the later 1990s, have had excellent participation in an AHEC co-sponsored Primary Care Elective (PCE-120) that has placed over 2,000 rising 1st year medical students in a rural or underserved primary care venue. LSUHCS-NO (since 1992) and Tulane (since 2000) both have required Family Medicine Clerkships, and all three medical schools now have some though limited representation by family physicians on their admissions committee. Louisiana AHEC has also created a "Day with the Doc" program which selects rural high school scholars, demonstrating an interest in pursuing a career as a physician, to spend the day at the medical school with 2nd year medical students for demonstrations and a Q&A session.

Two years ago, LSUHSC-NO initiated a Rural Scholars' Track which identifies students who want to practice in rural areas upon completion of their training. There are 19 students currently in the Rural Track. Six students have graduated in the track. LSUHSC-NO offers a tuition waiver for students who elect to enter this track. In exchange, the students agree to go into a generalist specialty (family medicine, pediatrics, internal medicine, ob/gyn) or general surgery, and to practice at least five years in a rural area upon completion of their residency. The rural track curriculum has been modified such that they spend one day a week with a rural physician during the entirety of their third and fourth years (LeBlanc, 2006).

Tulane's Department of Family and Community Medicine, through a Federal grant initiative, has created a rural program, called Tulane Rural Medical Education (TRuMEd) program. Designed to recruit and educate medical students who intend to enter practice in a rural area of Louisiana or the Gulf

South, particularly in the field of Family Medicine, TRuMEd utilizes a selective admission process as the key innovation. Aiming for a target of 8 students per class, the program has enrolled 2 inaugural classes, demonstrating that the selective admissions process can attract competitive students from rural areas of the state who would not otherwise have been admitted to medical school. TRuMEd students complete the standard Tulane University School of Medicine curriculum with extra features and emphasis that expose students to rural educational opportunities. (Tulane Department of Family and Community Medicine, 2006).

These programs are new and small, and have not yet had enough time to produce the first output from the pipeline. ***Even with these programs in place, Louisiana's historical difficulty in filling its Family Medicine residency slots with in-state or out-of-state students remains a concern.*** The state's medical schools have steered only a small portion of their graduates into Family Medicine training for the last 2 _ decades. (Appendix D) Between 1980 and 2006, 9.5% of all Louisiana medical school graduates (9.9%, 13.9% and 6.0% of graduating senior medical students from LSU-Shreveport, LSU-New Orleans and Tulane medical school, respectively), or an average of 38 students a year, entered Family Medicine residencies, with many of them going to programs out of the state. In 2006, 39 senior students, representing just under 10 of all state medical graduates (or 8.2%, 12.9% and 9.6% of LSU-S, LSU-NO and Tulane graduates, respectively), matched with Family Medicine positions.

Louisiana currently has eight Family Medicine residencies with a total of 53 new first year resident positions each year. (NB: A new LSUHSC-NO sponsored program in Rural Family Medicine in Bogalusa is in development and expected to create an additional 4 first year slots per year when it opens in 2007. There have been as many as 10 Family Medicine residencies with 73 first year slots in the past decade.) Obviously, the state's production of medical school graduates entering Family Medicine falls short of the residencies' capacity and need. Consequently, for most of the last 15 years, Louisiana significantly lagged the nation in filling its Family Medicine residency slots ranging from a low of a 31% fill rate on Match Day in 1992 to a high of 81% in 1998. Things changed, as illustrated in Appendix B, in 2006 when 92.5% of the state's Family Medicine residency slots were filled in the Match, due to a due to a purposeful strategy on the part of several residencies to rank and match International Medical Graduates to a much larger degree than in previous years. In fact, 31 of 56 (55.4%) of the new 2006 first year Family Medicine residents in the state are international graduates. A concern with International Medical Graduates is that many enter a residency only to fulfill licensure requirements rather than due to commitment to remain in a community, and hence many will leave the area once their requirements are met.

Of note, in 2006, 15 of the 31 (48.4%) IMGs are US citizens who went to an international medical school presumably because they were unable to get into a U.S. medical school, a point relevant to future comments on admissions policies. A recent report by the Educational Commission for Foreign Medical Graduates (Seeling, 2005) indicates that 23% of the 6,010 ECFMG certifications granted in 2004 were for U.S. citizens graduating from foreign medical schools. According to the director of AAFP's Medical Education Division, in 2005, three of five first year residents in family medicine are IMGs (American Medical Association, 2006). Dr. Fitzhugh Mullan, former director of the Health

Resources and Services Administration's Bureau of Health Professions, indicates that United States medical schools should increase its output to fill the gap in primary care rather than relying on foreign medical school graduates to fill residency match (AMA, 2006).

In summary, our state medical schools, while producing above average numbers of physicians for our population size have failed to steer enough to fill our own Family Medicine Residencies, hence contributing to the continued inadequacy of the Family Medicine workforce in the State. Recent programs that might partially address this concern are small and too new to measure results.

Louisiana Legislation:

Act 894 became law in the 2004 regular session. It indicates that the Louisiana Student Financial Assistance Commission will provide and administer a tuition payment program for 10 LSU and five Tulane medical students meeting the following criteria: are residents of Louisiana; desire to become medical doctors, meet the admissions criteria of the respective schools, and agree to practice the profession in a rural or medically disadvantaged area in Louisiana as determined by the Louisiana State University Health Sciences Center, acting jointly with the Tulane University School of Medicine, for at least five consecutive years after completion of their medical education and upon becoming licensed, practicing physicians. This type of program has been used successfully in other states to meet the medical needs of rural areas. However, the Act passed without funding.

Previously, in 1990, the state legislature passed the Health Care Access Act. Subpart A (Departments of Family Medicine) of the Act indicates that state schools of medicine must work in collaboration with the Louisiana Area Health Education Centers to improve and expand programs for rural and other health manpower shortage areas. It further directs state schools of medicine to: 1) encourage and coordinate the creation or expansion of a rural or other health manpower shortage preceptor program, 2) encourage family practice residency programs to provide an opportunity for residents to have at least a one-month rotation through a rural or other health manpower shortage setting, 3) encourage the development of relief service programs for rural or other health manpower shortage area physicians to facilitate access to continuing medical education, 4) encourage the development of family medicine clerkships, 5) encourage cooperation with the Louisiana Area Health Education Centers, 6) report to the legislature on its efforts to fulfill the intent of this Subpart to achieve a goal of increasing the number of first-year primary care residents in the state, and 7) encourage and promote the development of admissions policies that require each first-year class to include at least 50% of its students from health manpower shortage areas.

It is important to note that 1_ decades after the passage of the Health Care Access Act, Louisiana continues to struggle with a shortage of family physicians in most parts of the state. The Task Force concurs with the intent of this legislation and makes recommendations in line with the two Acts addressed above.

How Do We Improve Health in Louisiana?: The Role of Family Medicine

Improving the population's health requires a multi-factorial approach. However, there is compelling evidence that the health of a population is directly related to the presence of a vigorous and accessible primary medical care workforce (Starfield, Shi, Gover, & Macinko, 2005). Specifically, Family Medicine is the only discipline exclusively dedicated to primary care and family physicians are far more likely to serve rural and underserved populations. Nationally, family physicians are more than twice as likely as internal medicine physicians to practice in rural locations (Chen, Fordyce, & Hart, 2006).

Additionally, Family Medicine residencies exceed other specialties in retaining their graduates in state, especially in underserved areas. As an example, the now closed Earl K. Long Hospital Family Medicine Residency Program, which graduated 122 family physicians in its more than 25 year history, has retained 83% in state, 45% in Heath Professional Shortage Areas, and 20% in rural practice (Graham Center, 2006). All in all, 77% of the graduates of the State's Family Medicine residencies are in practice in Louisiana, 62% of then practicing in HPSAs, and 13% in rural areas. (Graham Center, 2006)

An orientation toward prevention and education is integral in the training of family physicians, who routinely counsel their patients about lifestyle decisions including smoking cessation, physical activity, and healthy eating. These are important steps to encourage healthy behaviors under the patient's control. However, macro-level factors such as poverty, availability of affordable insurance, and availability of healthcare providers, are also significant to ameliorating the population's ill health and require policy level intervention. Numerous studies, as cited below, conclude that the presence of primary care physicians confers more health and financial benefit than the presence of specialty care.

Benefits of Primary Care:

1. Population health benefits
Studies demonstrate that higher concentrations of specialists are associated with higher costs, higher mortality, and lower quality of care (Starfield, Shi, Gover, & Macinko, 2005; Baicker & Chandra, 2004). ***States with more primary care health care providers derive population health benefits through more effective care and less spending than those with more specialists*** (Baicker & Chandra, 2004). Additionally, an increase of one primary care physician per 100,000 population is associated with a reduction of 14.4 deaths per 100,000 population, or about a 2% decline in mortality over current levels. This effect is 2.5 times greater for minority groups (Shi, Macinko, Starfield, Politzer, & Xu, 2005).

2. Propensity to locate in rural areas
The Council on Graduate Medical Education and others indicates that ***family physicians are five to eight times as likely as other primary care physicians and specialties to practice in rural areas*** (Rabinowitz, Diamond, Markham, & Paynter, 2001). Additionally, among all specialties, family physicians are the only physicians who are as likely to settle in rural areas as is the general population. (Council on Graduate Medical Education, 1994). A recent study indicated that 67.8% of all rural counties that are not currently Primary Care Health Professional Shortage Areas (PCHPSAs) would become so if family physicians were removed from them. On the other hand, removal of all general internists would make only 2.1 percent of the counties

PCHPSAs, and only 0.5 percent would become PCHPSAs without pediatricians or without obstetricians/gynecologists. (Fryer, Green, Dovey et al, 2001). ***Thus, family physicians provide a disproportionate amount of care to rural residents.***

3. Breadth of preparation to address diverse needs of rural areas
There has been much attention recently paid to the concept of a personal primary care physician who serves a patient as his/her "medical home." The concept of the medical home is familiar to family physicians who would continue in this newly popularized model being discussed in the context of Health Care Redesign to serve their patients by providing accessible, accountable, comprehensive, integrated and patient-centered care for an individual (Martin et al., 2004). In the vision for redesigned health care in Louisiana, the medical home providers would be effectively integrated with other aspects of the health care system such as hospital services, and linked to them with an interoperable health information network. Because family physicians provide continuing and comprehensive health care encompassing all ages, both sexes, each organ system and every disease entity, and integrate biological, clinical, and behavioral science, they are ideal providers for medical homes. Furthermore, Family Medicine emphasizes disease prevention, health promotion and the behavioral skills needed along with acute and chronic care in this approach. This breadth of training has made family physicians the preferred rural health care professional as well as the most common physician discipline in community health centers across the country. Family Medicine has demonstrated a sustained emphasis on training students to prepare for service in rural areas through programs such as rural training tracks and post-residency fellowships in rural medicine (Graham Center, 2005), and a propensity to prepare physicians for practice in urban underserved areas.

4. Economic benefit
Investment in medical care in a rural community also brings substantial economic benefit. ***On average, the income that comes into a community due to the presence of one family physician, including from the additional jobs that result from his/her practice, amounts to approximately $1.2 million in rural areas, and, $0.9 million in urban areas*** (Oklahoma Physician Manpower Training Commission, 2003.)

Conclusions Related to the Future of Family Medicine in Louisiana

It is clear that there are economic and health benefits associated with increasing access to primary care. Access to primary care pre-Katrina and Rita was especially problematic in rural areas, but is now acute in the New Orleans Metro area as well. Physicians specializing in Family Medicine are more likely than those specializing in other areas of medicine to practice in rural areas. Therefore, any solution to the rural workforce problems must by necessity focus on family physicians, and workforce gaps in Region I argue for the need for family physicians there as well. Yet, there is a decreasing interest in Family Medicine among medical students nationally and in Louisiana. (See Appendix B). Only 8.2%-12.9% of LSU-Shreveport, LSU-New Orleans and Tulane medical school graduates in 2006 matched Family Medicine (FM) resident positions, and 56% of them will be leaving Louisiana for their residency training. ***To rectify the shortage of primary care doctors in Louisiana, attention must be focused on a multitude of issues related to the development and retention of family physicians for the State.***

The Rural Workforce Pipeline

The long-term solution to the rural medical workforce maldistribution has been likened to a pipeline. The first component of the pipeline involves identifying and developing those with early career interest in rural primary care and facilitating their admission to medical school. The second element of the pipeline involves a supportive medical school experience, so as to maintain the students' focus on future rural primary care practice. The third segment of the pipeline includes appropriate Family Medicine residency training with training options conducive to successful future rural practice for those targeting that locale. The final section of the pipeline involves support of practitioners, particularly those who enter rural practice where attrition is a serious concern. Attention to each aspect of the pipeline is critical in devising an effective comprehensive workforce development policy (Keck & Culbertson, 2004; See Appendix C for a copy of the Keck & Culbertson report). Attention must be paid to each segment of the pipeline in order for Louisiana to be successful in countering the shortage of family physicians in underserved communities.

1. Early Career Interest

Louisiana's four Area Health Education Centers (AHECs) are committed to expanding the health care workforce, maximizing diversity and facilitating distribution, especially in underserved communities. To achieve this goal, Louisiana AHECs offer many programs to expose elementary, middle school, and high school children to and enhance their interest in health careers. Because native Louisianians are more likely than those from other states to establish medical practices in Louisiana, PriceWaterhouseCoopers' (2006) recommendation that ***Louisiana should grow its own physician pool*** is congruent with the activities of Louisiana's AHECS. Task Force members and Residency Directors are encouraged to meet regularly with AHECs, local community leaders, middle and high school leadership, and regional colleges to explore the various ways in which they can contribute to fostering early career interest in Family Medicine.

2. Medical Schools

A. Admissions

Special admissions programs, such as that at the Jefferson Medical College in Pennsylvania, have been successful in increasing the number of practicing rural family physicians. Additionally, the short-term retention rate of these practicing rural physicians has been near 100% during the doctors' first 7-10 years in practice (Rabinowitz et al., 2001) and the long-term retention rate is nearly double the national average (Rabinowitz et al., 2005).

Targeted admissions policies have been shown to be the most critical and effective step in the production of rural physicians. Seventy-five percent of the success of the Physician Shortage Area Program of the Jefferson Medical College in Philadelphia is due to its admissions criteria (Rabinowitz et al., 2001). ***A rural background and career plans as a family physician at the time of admission to medical school*** have a powerful impact on future rural primary care practice. A critical admissions factor discussed in the literature is linking rural background with intent to practice Family Medicine in a rural area

(Rabinowitz, 1995; Rabinowitz, et al., 2001). A recent review of the literature indicates that physicians or their spouses with rural backgrounds are more than five times as likely to practice rurally (Keck & Culbertson, 2004).

It has been suggested that increased ***representation and leadership of generalist physicians on admission committees*** increase the likelihood that students admitted to the school will choose primary care careers (Schwartz et al., 2005). Additionally, ***targeted recruitment of applicants likely to become generalists*** is a powerful illustration of an institution's commitment to producing generalists (Schwartz et al., 2005).

B. Curriculum

Although less influential than admissions policies on ultimate area career choice and rural locations, ***medical school curriculum also asserts significant influence*** on outcomes. Louisiana's need for primary care physicians remains one of the highest in the nation. Despite the need, the state's medical schools continue to emphasize tertiary care with a dearth of generalist role models on the faculty (Streiffer, 1993). The recent Report on Louisiana Healthcare Delivery and Financing System produced by PriceWaterhouseCoopers (2006) for the Louisiana Recovery Authority emphasizes ***the continued need for Louisiana to increase its number of primary care faculty. Special programs for primary care*** have consistently produced a greater proportion of graduates in Family Medicine than from the traditional curriculum (Senf, Campos-Outcalt, & Kutob, 2003). Schools having ***clerkships in Family Medicine*** are more likely to graduate generalists than are schools without such clerkships (Schwartz et al., 2005). Lessons learned from the Robert Wood Johnson Generalist Physician Initiative and the Health Resources and Services Administration's Interdisciplinary Generalist Curriculum include the fact that students value interaction with patients and generalists through ***early generalist clinical experiences in medical school*** and appreciate having a ***generalist mentor*** (Schwartz et al., 2005). Among medical school experiences, the strongest predictor of deciding to practice in a rural setting is taking a ***rural clinical rotation*** (Keck & Culbertson, 2004; Rabinowitz & Paynter, 2002).

C. Financial

The predictive value of student debt on specialty choice appears to be important. PriceWaterhouseCoopers (2006) reports that ***Louisiana medical school graduates have a greater debt load than those in neighboring states***. They suggest that this factor may partially account for the dearth of primary care physicians in the state given their lower income potential as compared to physicians practicing specialized tertiary care. Another predictor of becoming a rural primary care practitioner is being the recipient of a ***National Health Service Corps (NHSC) scholarship.*** The NHSC scholarship program is a federal competitive program of service-obligated scholarships. Recipients receive monthly stipends as well as a lump sum payment to cover other educational expenses for the year. Medical school tuition and required fees are also paid. The student incurs one year of obligated service providing full-time primary care services in a HPSA for each year or partial year of scholarship funding. There is a minimum of two years service obligation.

Tuition and loan repayment opportunities such as the Loan Forgiveness Program through the National Health Service Corps (NHSC) or through state

programs improve the attractiveness of generalist careers and influences students' choice of medical school and residency training. Nearly 60% of NHSC alumni remain in generalist practice (Schwartz et al., 2005), although many experts in the field believe that programs which support graduates into a practice site of their choice, rather then assign them for a period of obligation, will have better long term retention results.

3. Residency Training and Practice Placement

Generally, Family Medicine residents who train in rural areas are more likely to stay in rural areas (PriceWaterhouseCoopers, 2006). However, individual Family Medicine residency programs have varying success in training graduates who locate in rural areas. Experience indicates that ***a majority of Family Medicine graduates practice within a 100 mile radius of their training,*** usually within the state of their training. Seventy-eight percent of graduates of the LSU Baton Rouge Family Medicine Residency Program, which is now closed, continue to practice in Louisiana. Seventeen percent are practicing in rural areas (Graham Center, 2006).

Improvement in placing more residents already in training in rural areas has the most immediate impact on increasing the supply of rural physicians. Training programs must assure that graduates have the skill set to be successful in rural areas. This requires a focused effort by residency directors and supervising medical schools to assure that their graduates have adequate experience to function without specialists immediately available. Recruitment to these programs can be improved by emphasizing that graduates are prepared to practice in rural areas. ***Residency programs with rural training tracks are correlated with producing rural physicians*** (Keck & Culbertson, 2004; Rabinowitz & Paynter, 2002).

Some have encouraged medical schools to develop an ***innovative primary care fast track*** where students are ***guaranteed preferential or early admission to generalist residency programs in underserved areas.*** For example, the American Board of Family Practice allows senior medical students to begin working as interns with restricted licenses, thus eliminating one year from the medical school residency pathway (Schwartz et al., 2005).

4. Other Primary Care Disciplines

Interest in primary care careers among all U.S. medical students has waned since the early 1990s as medical students have continued to demonstrate a preference for medical subspecialties over primary care. (American Academy of Family Physicians, 2006). However, the attrition of intent for generalist practice from the two other traditional primary care disciplines, Internal Medicine and Pediatrics, is considerably greater than in Family Medicine. While 90%-98% of Family Medicine residency graduates can be expected to enter primary care practice, only 19% of internal medicine residents (Garibaldi et al., 2005), 75% of pediatric residents (Althouse & Stockman, 2006) and 54% of Med/Peds residents (Melgar et al., 2006) are planning generalist careers, with the remainder opting for limited specialties. As a result, looking just at Internal Medicine residency positions, the largest residency field nationwide, and Family Medicine as the next largest, far more practicing primary care physicians will come from Family Medicine programs (conservatively, 90% x 2700 positions =

2430 as compared to 19% X 4700 =893 from Internal Medicine programs). Med/Peds is a very small program, with only about 300 positions nationwide, and a downward trend over recent years.

While some would argue that limited specialists provide a considerable amount of "hidden" primary care, evidence exists that seriously challenges the quality and cost efficiency of that care (Starfield, 2005). Further, limited specialists do not locate and cannot be sustained economically in rural and other underserved areas.

Hence, development of a primary care workforce, particularly for rural areas, will be disproportionately dependent on development of the Family Medicine workforce.

5. Practitioner Support

While recruitment is an essential component to increase physician supply, long term retention once physicians are placed is essential to resolving the rural physician workforce problem. ***Retention has the potential to have a greater impact than recruitment on the supply of rural physicians.*** When one considers the cost of recruitment and the issues involved in changing physicians every seven years, the value added of retention is likely to be even greater (Rabinowitz et al., 2005). For example, physicians who practice in the same rural area for the entirety of their career (e.g., 35 years) have a five-fold impact as compared to physicians who practice there for only seven years. It is thus essential that communities support the needs of rural physicians recruited to their area in order to enhance the likelihood of longevity.

Family physicians practicing in rural Pennsylvania were nearly four times more likely to consider relocating if they shared on-calls hours with only one other physician as compared to those who shared on-call hours with more than one other physician. Additionally, those in solo practice were greater than three times more likely to consider relocating than those in other types of practice (Forti et al., 1995). Reduction of on-call time appears especially important to retention. Pathman et al. (2004) found that among physicians working in HPSAs, retention was longer for those on-call two or fewer times per week. This suggests that ***a critical mass of physicians and organization of cross cover units and other means that support practitioners may enhance retention of physicians in rural areas.***

Though the vast majority of rural family physicians were satisfied with rural practice, complaints included professional isolation and perceptions about lower income and reimbursements than urban counterparts. However, ***when gross incomes are adjusted for cost of living, rural physicians actually have greater purchasing power than do urban physicians*** (Reschovsky & Staiti, 2005). Hence, concerns with income may not be major barriers to future rural practitioners beyond the general concerns and perceptions regarding income discrepancies of primary care physicians in general. ***Use of telecommunication systems*** for consultation and referrals has been suggested as a possible solution to isolation. ***Policy*** needs to address inequity of reimbursement as a function of practice location. The American Academy of Family Physicians is working to advocate with Congress for ***a schedule of care management fees*** that would pay generalists for e-mails, telephone calls, and case management provided to patients with chronic diseases (Schwartz et al. 2005).

Community Health Centers

While rural areas have a need for general surgeons, mental health and allied health professionals, the greatest need in rural areas across the United States is for primary care physicians (Rosenblatt et al., 2006). Community Health Centers (CHCs) are community-owned non-profit organizations providing family-oriented primary and preventive health care services and serving low income and medically underserved communities (Louisiana Primary Care Association, 2006; National Association of Community Health Centers, 2005). Federally Qualified Health Centers (FQHCs) and Rural Health Centers are included under the rubric Community Health Centers. There are currently 21

FQHCs and 1 "look-alike" facility. Including satellite centers, there is a total of 44 FQHCs in Louisiana (Sheffie, 2006).

Because the focus of FQHCs is provision of primary care in underserved communities, all FQHCs must employ primary care physicians. However, FQHCs may also offer additional types of care. ***Hence, 89% of all physicians staffing CHCs are primary care physicians and the majority of these are family physicians. These centers face current physician shortages and obstacles in recruiting and retaining health care professionals.***

Rural health clinics (RHC) were developed by the federal government to encourage and stabilize the provision of outpatient primary health care services for Medicaid and Medicare patients in rural areas provided by physicians, nurse practitioners, physician assistants and certified nurse midwives. These clinics, according to federal guidelines, are located in areas that are designated both by the Bureau of the Census as rural and by the Secretary of DHHS as medically underserved (Centers for Medicare and Medicaid Services, 2003) and can be for profit or not for profit public or private facilities. In addition, rural health clinic regulations distinguish between two types of rural health clinics: independent, and freestanding practice that is not part of a hospital, skilled nursing facility, or home health agency; and provider-based, an integral and subordinate part of a hospital, skilled nursing facility, or home health agency.

Currently, there are 87 rural health clinics in Louisiana. Although there are insufficient data available to determine the number and type of primary care physicians practicing in these clinics, it is very likely that the majority of physicians in these practices are Family Physicians.

Aside from the expanding role that these various FQHCs serve in rural and underserved communities, it seems likely that additional FQHCs and CHCs will be developed and serve an important role to the new delivery model in the context of Health Care Redesign for the New Orleans area. ***The demand for family physicians to work in the growing numbers or FQHCs and CHCs can therefore be expected to rise across the state. Further decline in the number of Family Medicine graduates coupled with the retirement of many family physicians will present even more challenges to CHCs.***

Med Job Louisiana

Many recruitment and retention programs have been successful in other areas of the country in countering the dearth of primary care physicians in underserved areas and with underserved populations. Louisiana must expand such successful strategies before the shortage of family physicians is further exacerbated. One recently created initiative is Med Job Louisiana, a non-profit recruitment and retention program that assists rural and medically underserved communities located in designated Louisiana Health Professional Shortage Areas (HPSAs) attract qualified health professionals to improve access to health services. Med Job Louisiana was based on a program that originated in North Carolina in 1973 and is a partnership of Louisiana Department of Health and Hospitals-Bureau of Primary Care and Rural Health and the Louisiana Area Health Education Centers (AHECs). Two AHEC recruiters, each covering a region of the state, provide professional recruitment services at no charge to assist communities in the recruitment of primary care physicians, dentists, mental health professionals and mid- level practitioners. Med Job

Louisiana also hosts recruitment events throughout the state coordinated by the program's events coordinator. These events provide organizations the opportunity to build relationships with medical candidates during their residency. Another component of the program is the Med Job Louisiana website, www.medjoblouisiana.com, which serves as a web-based posting of practice opportunities throughout the state and links interested candidates with the recruiters. Med Job reported about 230 open positions in its database of mostly rural and small communities, as of September 2006: 70 of those positions in Family Practice, 56 in Internal Medicine, 26 in pediatrics. In addition, a recent analysis of the deficiency of primary care providers in Region 1, conducted by DHH as part of the Redesign process, indicated a need for some 90 additional primary care physicians to serve the area's current Medicaid and unserved/uninsured population.

Though successful, additional or expanded recruitment and retention programs using proven strategies are needed to meet the growing needs of our state.

CONCLUSIONS

Congruent with the PriceWaterhouseCoopers' (2006) report to the Louisiana Recovery Authority, the Task Force draws the following conclusions based on the programs and findings cited above.

TASK FORCE CONCLUSIONS

1. *There are clear benefits to population health when there are more generalist physicians. This is especially true for minority populations.*
2. *Any effort to address rural workforce deficiency must focus on Family Medicine as the key medical discipline.*
3. *Since Katrina, the primary care workforce gap in the New Orleans has been exposed, and may best be met substantially with family physicians.*
4. *The health care literature demonstrates successful strategies to increase entry into Family Medicine as a specialty. Medical schools must focus on admitting the "right" candidate and must facilitate and maintain a focus on Family Medicine with curriculum, mentoring and financial support.*
5. *Some of the lowest cost work force solutions to increasing the Family Medicine workforce (e.g., selective admissions policies in medical schools) are the most effective strategies.*
6. *The "pipeline" for placing a family physician into a community is long - starting with recruiting, admissions to medical school, then residency training, and finally placement and hopefully long term retention and integration into a rural community for practice. Attention must be paid to each part of the pipeline and results can not be expected instantaneously.*

RECOMMENDATIONS

The Task Force makes the following recommendations, which again closely parallel those made recently to the Louisiana Recovery Authority (PriceWaterhouseCoopers, 2006).

TASK FORCE RECOMMENDATIONS

In order to assure a vibrant, high quality and appropriately distributed primary care workforce for the State of Louisiana, the following recommendations are put forth:

1. *Establishment of a Commission or Task Force on Family Medicine with longevity, to oversee a longitudinal process of analysis, policy development, fiscal responsibility in awarding of scholarships, and implementation of policy.*
2. *Collaboration with community entities, including the Louisiana Area Health Education Centers (AHECs), in identifying and mentoring students headed for primary care careers.*
3. *Creation of selective admissions practices into medical school for students who are most likely to practice in underserved areas.*
4. *Increasing exposure to Family Medicine, and explicitly to include rural Family Medicine, during medical school at each level (e.g., during each year).*
5. *Exploring and developing financial incentives and support for students to train in rural Louisiana and primary care sites such as Community Health Centers (CHCs).*
6. *Assuring that the state's Family Medicine Residencies have adequate capacity and resources to address state need, are appropriately geographically distributed, and are sustained at the highest quality.*
7. *Exploring and developing financial incentives for physicians to practice and remain in rural areas.*
8. *Creation of an ongoing entity charged with physician work force planning and policy.*
9. *Longitudinal data collection for workforce planning and evaluation of programs.*
10. *Ensure that the Healthcare Redesign Collaborative is made aware of the Task Force's Final Report.*

(Please see http://www.dhh.state.la.us/offices/page.asp?ID=88&Detail=4238 for complete reports and documents cited above).

References

Althouse, LA & Stockman, JA 3rd. (2006). Pediatric workforce: A look at general pediatrics data from the American Board of Pediatrics. Journal of Pediatrics, 148(2), 166-169.

American Academy of Family Physicians . (2006). 2006 National Residency Matching Program. http://www.aafp.org/match

American Academy of Family Physicians. (2005). http://www.aafp.org/match/

American Medical Association. (2006). International Medical Graduates in the U.S. Workforce: A Discussion Paper. http://www.ama-assn.org/ama1/pub/upload/mm/18/workforce2006.pdf

Baiker, K. & Chandra, A. (2004) Medicare spending, the physician workforce, and beneficiaries' quality of care. *Health Affairs, Web Exclusive 4*, 184-197.

Centers for Medicare and Medicaid Services. (2003) Fact Sheet: Rural Health Clinic. http://www.cms.hhs.gov/MLNProducts/downloads/2006rhc.pdf.

Council on Graduate Medical Education. (1998). Physician Distribution and Health Care Challenges in Rural and Inner City Areas. Rockville, MD: US Department of Health and Human Services as cited in Rabinowitz & Paynter (2002).

Forti, E.M., Martin, K.E., Jones, R.L., & Herman, J.M. (1995). Factors influencing retention of rural Pennsylvania Family Physicians. The Journal of the American Board of Family Practice, 8(6), 469-474.

Fryer GE, Green LA, Dovey SM, et al. (2001) The United States relies on family physicians unlike any other specialty. AAFP, 63, 1669.

Garibaldi, RA, Popkave, C, & Bylsma, W. (2005). Career plans for trainees in internal medicine residency programs. Academic Medicine, 80(5), 507-512.

Graham Center. (2002). Family Physicians are the Main Source of Primary Health Care for the Medicare Population. http://www.graham-center.org/x386.xml]

Graham Center. (2003). The U.S. Primary Care Physician Workforce: Persistently Declining Interest in Primary Care Medical Specialties. http://www.graham-center.org/x468.xml.

Graham Center. (2005). The Family Physician Workforce: The Special Case of Rural Populations. http://www.aafp.org/afp/20050701/graham.html.

Graham Center. (2006). Closing Family Medicine Residency Programs Footprint Maps. http://www.graham-center.org/x816.xml.

Keck, A.E. & Culbertson, R.A. (2004). Literature review: Influencers on physician choice to practice in rural areas. Unpublished manuscript prepared for the Louisiana Department of Health and Hospitals/Bureau of Primary Care and Rural Health.

LeBlanc, K.E. Personal communication. September 21, 2006.

Louisiana Department of Health and Hospitals. Health Professional Shortage Area Map. http://www.dhh.state.la.us/offices/miscdocs/docs-88/Maps/010606%20geo%20pc%20hpsa%20mapflat.jpg. Accessed April 2, 2006.

Louisiana Primary Care Association. Frequently Asked Questions. http://www.lpca.net/main4/r_and_r/index.php?page=r_and_r_faqs. Accessed May 1, 2006.

Louisiana State Legislature (2004). Act. No. 894. http://www.legis.state.la.us/leg_docs/04RS/CVT9/OUT/0000LWOF.PDF

Martin, J. C. et al. (2004). The future of family medicine: A collaborative project of the family medicine community. Annals of Family Medicine, 2(suppl 1).s4-s32.

Melgar T. Chamberlain JK. Cull WL. Kaelber DC. Kan BD. (2006). Training experiences of U.S. combined internal medicine and pediatrics residents. Academic Medicine. 81(5):440-446.

National Association of Community Health Centers. (2005). Fact sheet: America's health centers: 40 years of commitment and success. http://www.nachc.com/research/Files/IntrotoHealthCenters8.05.pdf

Oklahoma Physician Manpower Training Commission, October 2003

Pathman, D.E., Konrad, T.R., Dann, R., & Koch, G. (2004). Retention of primary care physicians in rural Health Professional Shortage Areas. American Journal of Public Health, 94(10), 1723-1729.

PriceWaterhouseCoopers (2006). Report on Louisiana Healthcare Delivery and Financing System. http://www.lra.louisiana.gov/assets/PwChealthcarereport42706l.pdf

Rabinowitz, H. (1995). Recruitment and retention of rural physicians: How much progress have we made? The Journal of the American Board of Family Practice, 8(6), 496-499.

Rabinowitz, H.K. & Paynter, N.P. (2002). The rural vs. urban practice decision. Journal of the American Medical Association, 287(1), 113.

Rabinowitz, H.K., Diamond, J.J., Markham, F.W., & Paynter, N.P. (2001). Critical factors for designing programs to increase the supply and retention of rural primary care physicians. Journal of the American Medical Association, 286(9), 1041-1048.

Rabinowitz, H.K., Diamond, J.J., Markham, F.W., & Rabinowitz, C. (2005). Long-term retention of graduates from a program to increase the supply of rural family physicians. Academic Medicine, 80, 728-732.

Reschovsky, J.D. & Staiti, A. (2005). Physician incomes in rural and urban America. Health System Change, Issue Brief No. 92. http://www.hschange.org/CONTENT/725/725.PDF

Rosenblatt, R.A., Andrilla, C.H.A., Curtin, T., & Hart, L.G. (2006). Shortages of medical personnel at Community Health Centers: Implications for planned expansion. Journal of the American Medical Association, 295, 1042-1049.

Senf, J.H., Campos-Outcalt, D., & Kutob, R. (2003). Factors related to the choice of Family Medicine: A reassessment and literature review. The Journal of the American Board of Family Practice, 16(6), 502-512.

Schwartz, M.D., Basco, W.T., Grey, M.R., Elmore, J.G., & Rubenstein, A. (2005). Rekindling student interest in generalist careers. Annals of Internal Medicine, 142(8), 715-724.

Seeling, S.S. (2005). Educational Commission for Foreign Medical Graduates. http://www.ama-assn.org/ama1/pub/upload/mm/18/i05seeling-slides.pdf

Sheffie, A.Y. (2006). Personal communication. May 29, 2006.

Shi, L., Macinko, J., Starfield, B., Politzer, R., & Xu, J. (2005). Primary care, race, and mortality in US states. Social Science & Medicine, 61, 65-75.

Starfield B. Shi L. Macinko J. (2005). Contribution of primary care to health systems and health. Milbank Quarterly. 83(3), 457-502.

Starfield, B. Shi, L, Gover, & Macinko, J. (2005). The effects of specialist supply on populations' health: Assessing the evidence. *Health Affairs, Web Exclusive 5,* 97-107

Streiffer, R. H. (1993). Louisiana's need for primary care physicians: Let's not forget the role of medical education. Journal of the Louisiana State Medical Society, 145, 483-487.

Tulane Department Family and Community Medicine. (2006). http://www.fammed.tulane.edu/trumed/ Accessed September 21, 2006.

United Health Foundation. (2004). America's Health: State Health Rankings—2004 Edition.

Appendix A

Definitions of Family Medicine and Primary Care

Family Medicine:

"Family Medicine is the medical specialty which provides continuing, comprehensive health care for the individual and family. It is a specialty in breadth that integrates the biological, clinical and behavioral sciences. The scope of Family Medicine encompasses all ages, both sexes, each organ system and every disease entity."
http://www.aafp.org/online/en/home/policy/policies/f/familymedicine.html
Accessed 5-12-2006

Primary Care:

"Primary care is that care provided by physicians specifically trained for and skilled in comprehensive first contact and continuing care for persons with any undiagnosed sign, symptom, or health concern (the "undifferentiated" patient) not limited by problem origin (biological, behavioral, or social), organ system, or diagnosis.

Primary care includes health promotion, disease prevention, health maintenance, counseling, patient education, diagnosis and treatment of acute and chronic illnesses in a variety of health care settings (e.g., office, inpatient, critical care, long-term care, home care, day care, etc.). Primary care is performed and managed by a personal physician often collaborating with other health professionals, and utilizing consultation or referral as appropriate.

Primary care provides patient advocacy in the health care system to accomplish cost-effective care by coordination of health care services. Primary care promotes effective communication with patients and encourages the role of the patient as a partner in health care."
http://www.aafp.org/online/en/home/policy/policies/p/primarycare.html
Accessed 5-12-2006

Appendix B

Action Item Ratings and Priority List

Twenty-seven Task Force members responded to an electronic survey and rated each potential action item listed below on a scale ranging from 1 (lowest priority) to 5 (highest priority). Mean response score and number of members ranking each item among the top five priority areas are in parentheses. Top priorities are in ***bold italic*** font.

Action Items

(mean; # members ranking item among top 5 priorities)
Top Priorities in Bold, Italic font

These statistics are based upon responses of ***27*** Task Force Members.

Pre-admissions recruitment

Recruit students before college (3.185; 3)

Recruit students in college. (3.778; 4)

Develop new health career academies in high school to capture students' attention before college begins. (3.074; 2)

Collaborate with community entities, including AHECs, in identifying and mentoring students. (4.00; 9)

Admission policies

Create preferential admissions practices for students who are more likely to practice in underserved areas. (4.296; 15)

Increase the number of Family Physicians on admissions committees.
(4.148; 5)

Develop target goals for admissions and report progress to the legislature. (i.e., hold medical schools accountable). (4.185; 4)

Financial Incentives for Students and Practitioners

Fund the State Loan Repayment Program and open it to private or for-
profit practices. (3.926; 6)

Fund 15 additional forgivable loan slots. (3.889; 3)

Develop consortia of communities to fund loan repayment and scholarships. (3.815; 4)

Explore and develop financial incentives for students to train in rural areas and for physicians to enter practice and remain in rural areas. (4.259; 12)

Continue to offer/generate rewards for physicians who serve as adjunct faculty in rural areas. (3.593; 1)

Create a state income tax credit for community doctors who teach during clerkships. (3.556; 3)

Data Collection

Gather data to support the positive economic impact Family Physicians have on a rural community. (3.889; 1)

Encourage academic research in rural health. (3.148; 0)

Accumulate, organize, and refine data on local shortage and needs. (3.778; 3)

Marketing

Train communities on how to recruit and retain Family Physicians. (3.778; 3)

Increase awareness of the need for and positive outcomes of rural health. (3.741; 1)

Economic Development

Develop the economic benefit argument for improved physician workforce. (4.00; 0)

Partner with industry on training, recruitment, and retention of Family Physicians. (3.519; 3)

Provision of Rural Health

Partner with rural hospitals to ensure their health and continued existence. (3.407; 3)

Political Strategies

Establish a permanent Commission on Family Medicine. (4.00; 8)

Partner with the Health Works Commission. (3.556; 0)

Residency Issues

Explore expansion of rural residency curricula and/or residency programs. (3.556; 3)

Create a residency dedicated to training urban Family Physicians. (2.667; 0)

Increase financial support for existing residencies. (3.963; 6)

Malpractice Issues

Give Family Medicine Physicians in rural areas breaks on medical malpractice insurance. (3.741; 3)

Extend malpractice breaks to preceptors who are donating their time to train students. (3.889; 2)

Develop a malpractice insurance rate specific to Family Physicians delivering babies. (3.37; 1)

Medical School Curriculum Policy

Increase exposure to rural Family Medicine during medical school at each level (e.g., during each year). (4.333; 8)

Develop a financial solution to housing for medical students throughout the state. (3.333; 1)

Involve all CHCs/FQHCs as key teaching sites early in medical students' careers. (3.556; 5)

Institute a mandatory 8 week rural rotation in medical school. (3.852; 5)

Encourage and develop innovative curricula at the state level. (3.704; 3)

Appendix C

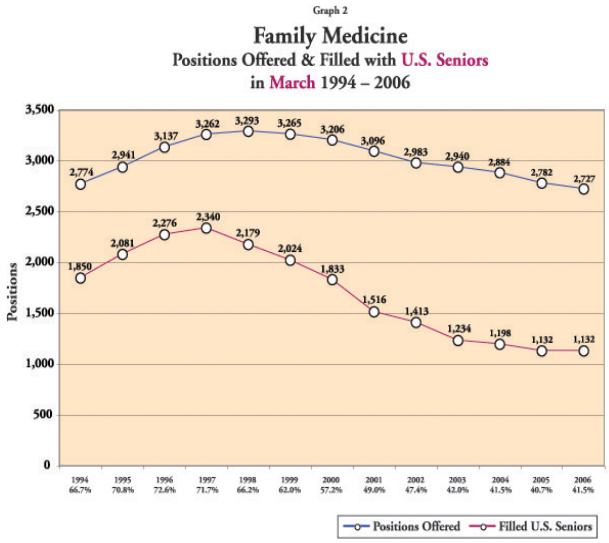
NATIONAL and LOUISIANA FAMILY MEDICINE MATCH DATA

NATIONAL and LOUISIANA FAMILY MEDICINE MATCH DATA, MARCH 2006

With the exception of 2006, when Louisiana boosted its Family Medicine residency Match Day fill rate with International Medical Graduates, Louisiana has lagged substantially behind the national Family Medicine residency fill rate. By July 1 of each year, most residency slots have been filled through the "scramble."

Recent comparison Match Day national fill rates:

Year	National FM Fill Rate	Louisiana FM Fill Rate	# of Louisiana FM PGY1 Positions Offered	# of Louisiana FM PGY1 Positions Filled
2006	85.0%	92.5%	53	56
2005	82.4%	69.2%	52	36
2004	78.8%	68.4%	57	39
2003	76.3%	57.1%	56	32
2002	79.0%	61.4%	57	35
2001	76.3%	57.1%	63	36
2000	81.2%	71.4%	63	45
1999	82.6%	62.0%	73	45
1998	85.5%	81.0%	64	52
1997	89.1%	78.0%	51	40
1996	90.5%	62.0%	47	29
1995	87.1%	43.0%	42	18
1994	82.7%	57.0%	39	22
1993	77.3%	54.0&	37	20
1992	67.5%	31.0%	32	10



Fewer than 13% of all medical students in Louisiana enter Family Medicine. Overall, slightly less than one-half of these students remain in state. Details are given in the table below.

Students finishing at LA Med Schools & entering Family Medicine in 2006:

	Sr. Class size	Matching w/ FM Total (% of class)	Remaining in La / Leaving La
LSU-S	93	12 (12.9 %)	7 (58%) / 5
LSU-NO	159	13 (8.2 %)	8 (62%) / 5
Tulane	146	14 (9.6 %)	2 (15%) / 12
Total	**398**	**39 (9.8%)**	**17 (44%)/ 22**

Appendix D

Graduating Seniors of Louisiana Medical Schools Who Entered Family Medicine Residencies - 26 Classes, from '81 thru '06

	80-81	81-82	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93
LSU-NO													
# graduates	178	171	173	178	178	178	157	162	179	153	163	165	174
# entering FM	20	15	22	20	21	23	12	9	14	10	5	11	13
% class in FM	11.2%	8.8%	12.7%	11.2%	11.8%	12.9%	7.6%	5.6%	7.8%	6.5%	3.1%	6.7%	7.5%
LSU-S													
# graduates	86	98	98	95	101	102	92	86	96	87	92	93	90
# entering FM	12	11	13	20	18	16	9	8	8	8	8	11	11
% class in FM	14.0%	11.2%	13.3%	21.1%	17.8%	15.7%	9.8%	9.3%	8.3%	9.2%	8.7%	11.8%	12.2%
Tulane													
# graduates	152	156	150	150	143	147	140	156	149	141	140	146	148
# entering FM	4	6	9	10	3	7	4	6	3	2	6	5	13
% class in FM	2.6%	3.8%	6.0%	6.7%	2.1%	4.8%	2.9%	3.8%	2.0%	1.4%	4.3%	3.4%	8.8%

FM PGY1- Total # Positions Offered in LA FMRPs	32	37
M PGY1- # Positions Filled In LA FMRPs on Match Day	10	20
Match Day Fill Rate % in LA	31%	54%

% of All Graduating U.S. Medical Students Matching In FM Residencies	14.6%	13.3%	13.8%	14.8%	11.1%	11.1%	10.9%	10.6%	10.8%	12.6%

(Source: AAFP/NRMP)

	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	LA Totals
LSU-NO														**81 thru 06**
# graduates	159	184	161	179	160	160	179	169	168	161	176	166	159	**4,388**
# entering FM	28	29	16	28	23	22	20	14	13	9	11	15	13	**436**
% class in FM	17.6%	15.8%	9.9%	15.6%	14.4%	13.8%	11.2%	8.3%	7.8%	5.6%	6.3%	9.0%	8.2%	**9.9%**
											Cumm	*Annual*	*Aver*	***16.8***
LSU-S														
# graduates	96	96	90	100	97	90	99	93	96	96	99	100	93	**2,461**
# entering FM	16	19	18	23	17	12	13	7	18	14	12	8	12	**342**
% class in FM	16.7%	19.8%	20.0%	23.0%	17.5%	13.3%	13.1%	7.5%	18.8%	14.6%	12.1%	8.0%	12.9%	**13.9%**
											Cumm	*Annual*	*Aver*	***13.2***
Tulane														
# graduates	142	121	148	140	140	150	146	149	145	153	155	143	146	**3,796**
# entering FM	14	5	14	7	12	10	12	14	10	12	14	13	14	**229**
% class in FM	9.9%	4.1%	9.5%	5.0%	8.6%	6.7%	8.2%	9.4%	6.9%	7.8%	9.0%	9.1%	9.6%	**6.0%**
											Cumm	*Annual*	*Aver*	***8.8***

FM PGY1- Total # Positions Offered in LA FMRPs	39	42	47	51	64	73	63	63	57	54	57	52	53
M PGY1- # Positions Filled In LA FMRPs on Match Day	22	18	29	40	52	45	45	36	35	32	39	36	49
Match Day Fill Rate % in LA	56%	43%	62%	78%	81%	62%	71%	57%	61%	57%	68%	69%	92%
% of All Graduating U.S. Medical Students Matching In FM Residencies	14.0%	15.4%	17.0%	17.3%	16.0%	14.8%	13.6%	11.2%	10.5%	9.2%	8.8%	7.7%	8.2%

(Source: AAFP/NRMP)

Louisiana Totals: Total Louisiana Graduates, 23 classes, '81 through '06	**10,646**
# Who Entered Family Medicine	**1,007**
% of Graduates Entering FM 1981-2006	**9.46%**

Source: American Academy of Family Physicians and Deans' Offices

Compiled by Rick Streiffer, MD, Tulane University 504-988-4700

Appendix E

Influencers on Physician Choice to Practice in Rural Areas

Literature Review

Influencers on Physician Choice to Practice in Rural Areas

May 18, 2004

Prepared for:

Louisiana Department of Health and Hospitals
Bureau of Primary Care and Rural Health

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Executive Summary

While the number of physicians per capita in the United States has increased considerably over the past 40 years, over twenty-million American's continue to live in formally designated urban and rural Health Professional Shortage Areas. This paper reviews the existing literature related to rural areas which attempts to 1) determine what factors are associated with a primary care physician's decision to practice in rural America, and 2) describe the organization and effectiveness of programs put into place by medical schools throughout the United States to produce more rural primary care physicians.

Guidance for Louisiana

The research is generally consistent on both fronts – predictors of a physician's choice to practice rural primary care do exist, as do effective medical school programs to produce rural primary care physicians built on an understanding of these predictors. Aside from financial incentives such as the National Health Service Corps, the strongest predictors of a physician's decision to practice rural primary care are the physician's rural upbringing, and the desire upon entering medical school to practice primary care and/or to practice rurally. Additional predictors include the physician's race and gender.

Medical schools that are successfully producing rural primary care practitioners at two to four times the national average naturally attract qualified rural applicants with the desire to practice rural primary care. These schools also actively recruit, and often preferentially admit, these applicants, and support them with programs providing exposure to rural settings, while training them to master rural case's unique demands. Both rural exposure and focused training are predictive of the decision to practice rural primary care.

Introduction

The maldistribution of physicians by specialty and geography in the United States has been long recognized and is well documented. As far back as 1910, the Flexner report identified that an important goal of medical education was to "…distribute as widely as possible the best type of physician…"[i] Since that time the Council on Graduate Medical Education, the Institute of Medicine, and a growing list of federal and state agencies have worked to identify, quantify and address the problem.[ii] Yet still today, while 20% percent of the population in the United States lives in a rural area, they are served by only 9% of the nation's physicians. Furthermore, twenty-two million people live in Health Profession Shortage Areas, formally designated as such due to primary care doctor to patient ratios of 1:3500 or less.[iii]

Of interest to many researchers are the predictors of practice in underserved areas by physicians of all types, particularly primary care physicians. Various categories of predictors examined have included personal, family and community characteristics, economics, physician attitudes, workplace and practice characteristics, and education & training experience.[iv,v,vi] The common wisdom is that by better understanding why individuals practice in underserved areas (by choice or otherwise), policies and programs may be designed to increase physician supply.

A body of related literature also examines the association between rural/underserved practice location and the physician's previous participation in government, medical school, and residency programs – primarily to validate the past, continued, or expanded funding of these programs.[vii,viii,ix] In addition, best-practice reports on the organization and effectiveness of the several medical school programs producing rural primary care physicians at two to four times the national average do exist, and additional information concerning these programs is available at their web-sites.

This literature review was conducted for the Louisiana Department of Health & Hospitals, Bureau of Primary Care and Rural Health in order to specifically address the following issues related to the rural physician workforce:

1. Attributes of prospective and current medical students, residents, and practicing physicians associated with primary care practice in an underserved location;
2. Environment and social factors associated with the decision to practice a primary care discipline in an underserved served location;
3. The role of medical school admissions and training programs in influencing the decision to practice primary care in an underserved location;

Sources of information referenced for this paper include peer-reviewed journals such as *Health Affairs*, the *Journal of the American Medical Association*, the *Journal of Medical Education* and *Academic Medicine*; reports and statistics produced by the Council on Graduate Medical Education and the Department of Health & Human Services Health Resources and Services Administration; professional organizations such as the Association of American Medical Colleges and the Society of Teachers of Family Medicine; and the web-sites of medical schools with programs in rural medicine and primary care.

There are a number of issues related to physician distribution which are generally beyond the scope of this review. These include:

1. Health insurance. As reported by the Council on Graduate Medical Education's 10th Report "it is impossible to disentangle the issue of geographic mal-distribution from that of health insurance."[x] Underserved populations are disproportionately uninsured or underinsured. The economic disincentives for physicians to locate in areas where they must provide a large amount of un-reimbursed care are obvious, but the solutions are not.
2. Economic incentives. Scholarships, loans, tax incentives, loan repayment programs, direct payments and disproportionate payments for services are in effect nation-wide. Pathman *et. al.* report that in 2000, eighty-two state level programs were operating in forty-one states, in addition to federal programs such as the National Health Service Corps.[xi] These programs often attract physicians to underserved areas, but do not necessarily guarantee the long term retention of those physicians.
3. Choice of a generalist specialty. There is substantial literature concerning the predictors of specialty choice. In an excellent review article on the subject, Rabinowitz reports that several studies have identified predictors of a career in a generalist specialty, and one of these predictors is a rural upbringing. Furthermore, "combining an interest in (or practice of) the specialty of Family Medicine with rural background has a cumulative impact."[xii]

Overview of the Literature

Personal Attributes Influencing Specialty and Practice Location

It is generally accepted that among the strongest predictors of primary care practice in rural and underserved locations in the United States are the personal attributes of the physician which exist prior to their entry into medicine, and much of the recent literature builds on this history[xiii,xiv,xv] Gang *et al.*, in 1997 for instance, expands on the factors predictive of rural practice location to address the more specific problem of location in an underserved area, and in 2000 Stearns *et al.* discuss the Illinois RMED program to produce rural family physicians in terms of this

cumulative research history. This research extends internationally where similar findings have been reported in Canada and Australia – countries with medical education systems and rural healthcare needs similar to the US. [xvi,xvii]

Historically, for example, in a 1985 review of 1969-1973 University of South Dakota School of Medicine graduates, Leonardson, Lapierre and Hollingsworth reported that the size of the community in which the physician and spouse were raised, size of the physician's high school class, and the closeness of practice location to the physician's hometown were all significantly and positively correlated with choice of practice location.[xviii] Ten years earlier, a larger study reviewing all 1965 graduates of US medical schools performed by the Rand Corporation found significant relationships between practice location and both a preference for urban or rural living, and place of rearing.[xix]

Both of these early studies suffered from the problem that a number of the predictor variables were not independent or one another. For example, in the Leonardson, *et al.* study, contact with other physicians, importance of continuing education to the physician, and local opportunities for professional growth, were all measured as independent predictors. While no report of multicollinearity was made in this study, it might be assumed that these three predictors are actually closely related. In the Rand study the authors report that some statistically significant correlations between independent variables were indeed found, but the relationships were discounted by the authors as negligible.

More recently, and in part to account for poorly isolated predictors in previous studies, Rabinowitz, *et al.* published a study of 1993 survey results of 2,955 physicians randomly sampled from all 1983-1984 US medical school graduates.[xx] In this study, he and his colleagues examined which of the many possible interacting predictive factors had a significant effect on practice location, and found that "four independent predictors of providing care to underserved populations" were:

1. Being a member of an underserved minority;
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;
4. Growing up in an underserved area.

There is a "dose" response to these four predictors – 86% of physicians with all four factors were providing substantial care to underserved patients, while 65%, 49% and 34% with any combination of 3, 2 and 1 factors respectively were providing the same. Only 22% of physicians with none of the predictors above were providing significant care to the underserved. Rabinowitz notes that the attributes numbered one, two, and four above can be identified at the time of admission to medical school, and importantly, at little cost to the institution.

In a similar study in 2001, Rabinowitz, *et al.* again examined the predictive factors of rural primary care supply and retention, in this case examining a database of 3,414 Jefferson Medical College graduates for which he

and his colleagues had prospectively and longitudinally collected data related to specialty and practice location for over 16 years.[xxi] The intent was to measure the effectiveness of JMC's Physician Shortage Area Program (which will be discussed in a later section).

Nineteen separate predictor variables – chosen for their previously hypothesized role in the literature to influence practice location and specialty – were collected for each Jefferson Medical College graduate between 1978 and 1993 (not all predictors were collected each year). These included:

1. **Demographic background**: sex, growing up in a rural area or small town, father's education, mother's education, and age entered medical school;
2. **Pre-medical background**: attended college in a rural area or small town, undergraduate science GPA, and MCAT biology and reading scores;
3. **Career plans**: plan for family practice, plan to practice in a rural area or small town, expected length of work week after training, and anticipated percentage of low-income patient in own practice;
4. **Medical school programs and curricula**: PSAP, NHSC scholarship program, rural or small town location of required 3rd year Family Medicine clerkship, and elective senior year rural Family Medicine preceptorship;
5. **Economic considerations**: freshman year expectation of peak income, and total medical school debt.

Of the 19 variables outlined above – only six were significantly and independently predictive of whether or not the physician was practicing primary care in a rural area. These are summarized below in Table I.

Table I: Significant Predictors of Rural Practice
Rabinowitz, *et al.* 2001

Predictor	Odds ratio (95% CI)	P Value
Freshman year plans for family practice	2.3 (1.6-3.5)	<.001
PSAP participant	2.5 (1.5-4.1)	<.001
NHSC scholarship	2.6 (1.3-5.1)	.006
Rural preceptorship	2.4 (1.6-3.7)	<.001
Male gender	1.8 (1.1-2.7)	.010
Growing up in a rural area[†]	4.0 (2.1-7.6)	<.001

For graduates with four or more of the first five factors, 34.3% were practicing rural primary care, as compared to 3.0% of the graduates with none of these factors.

In addition, two factors proved to be predictive of retention (10 years or more) of primary care physicians in rural practice – PSAP participation and attendance at a rural college for undergraduate studies. Those participating

[†] This factor was available only for the years 1978-1982

in PSAP and those who attended a rural college were respectively 4.7 and 7.2 times as likely to still be practicing in a rural area 10 or more years after graduation versus those who did not.

As did Rabinowitz and his colleagues, other studies have found that race of the physician is an important predictor of service to minorities and the underserved.[xxii] In a 1996 article published in *Inquiry*, Cantor, Miles and Baker reported on data extracted from the nationally administered 1987 and 1991 Surveys of Young Physicians. After controlling for interaction between predictors, the authors found that the race/ethnicity of the physician is the most important predictor of providing service to Black, Hispanic, poor, and uninsured patients. Gender also played an important role, as women self-reported that they provide significantly more care to these populations than did men. This is in contrast to the findings of Rabinowitz's studies of rural practice where women are underrepresented.

This last note, on the paucity of women in rural practice, is of growing concern. As the number of women in medicine rapidly increases, their continued under-representation in rural settings must be understood and addressed. This phenomenon is sufficiently important to be one of only twenty recommendations in COGME's previously referenced 10th report.

Environmental and Social Factors Influencing Specialty and Practice Location

In addition to the personal attributes described above, researchers are interested in environmental and social factors which influence specialty and practice location. Ricketts, Konrad, and Wagner describe a taxonomy categorizing these factors into three categories:[xxiii]

1. **Local community environment** such as the geography and settlement patterns, demography and social-economic structure as it effects healthcare, and the social, economic and political characteristics of the community;
2. **Proximal healthcare resources environment** such as complementary or conflicting delivery systems in the community or nearby: other physicians, clinics and hospitals, availability of subspecialties for consultation, and non-medical health services;
3. **External health policy environment** including the licensing and regulatory activities of the local, state and federal government, public financing for healthcare, and the presence of professional organizations and complementary government programs.

In the previously referenced study of all 1965 US medical school graduates Cooper, *et al.* did attempt to measure physicians' self-reported importance of environmental and social factors – such as opportunities for social life and prospect of being influential in the community.[xxiv] While climate and geography of the area, availability of clinical support, and opportunity for regular contact with a medical school or medical center were each cited as top

reasons for choice of location by primary care physicians, only the opportunity for regular contact with a medical school or medical center was significantly associated with choice of location. Additional statistically significant environmental/social factors included the efforts of the community to recruit the physician, *proximity* to a medical center, opportunities for a social life, prospect of influence in community affairs, and cultural advantages. In each of these cases (except for community recruitment efforts which may be confounded with economic incentives), physicians expressing strong preferences were more likely to be located in urban areas.

The same researchers did attempt to measure the influence of the physician's spouse (identified at the time as the wife, as only male physicians were surveyed) through a separate survey, and although more than 80% of the physicians and their wives agreed that the wife was not a great influence, there was, in fact, a significant positive correlation between wives who considered their careers important, were concerned about the quality of the schools, ranked cultural advantages highly, and the ultimate location of the physicians practice in an urban area.

In a Manitoba, Canada study, Carter calculated likelihood ratios for non-urban practice by: residence at grades 1st-8th, 9th-12th, and graduation, background of spouse, and by parental farming background against other types of professions.[xxv] His study found that physicians whose parents were farmers were more than 7 times more likely than those with white collar or business-owning parents to choose a rural practice location (but only 2.44 times more likely if at least one parent was a health care professional).

Laven *et al.* in their Australian study, report that physicians with a rural background, or with spouses with a rural background, were more than 5 times as likely to practice in a rural area.[xxvi] Physicians with an urban background, and spouses with a rural background, were almost 3 times as likely to practice rurally. There is no time consideration in this calculation, therefore it is not clear if, for instance, physicians married after entering a rural environment, and thus was more likely to have married partners with a rural background. Personality of the group practice, and contact with other physicians or a medical facility showed significance in these studies also.

With respect to women physicians, D'Elia and Johnson found that the presence of a physician relative in the area was positively associated with a rural practice location[xxvii]. In a small study of all primary care practitioners recruited from 1992-1999, and practicing in towns of less than 10,000 in Alaska, Idaho, Montana, Washington and Wyoming, Ellsbury reported interesting differences in the self-reported importance of various environmental and social factors during the recruitment process. These are summarized below in Table II.[xxviii]

Table II: Important Factors During the Recruitment Process in Rural Cities

Factors During the Recruitment Process	Important to %	
	Men	Women
Flexible work hours	25	66
Employment opportunities for spouse	26	58
Ability to work part-time	14	38
Availability of child care	3	33

In addition, Ellsbury, *et al.* found that there was a non-significant trend for women to work more often in a group practice than men, that 52% of women who were being recruited also had spouses looking for work (vs. 24% of men significant at $p<.05$), and that men worked an average of 44.4 hours a week in direct patient care versus women who worked 38.5 hours per week (significant at $p<.05$).[xxix]

All of these, if better isolated and measured, could conceivably reveal the importance of the complex social network which is the pre-requisite to remuneration for both men and women to consider practicing in a rural location. In the literature search, no mention was found of marital and childbearing patterns of physicians over time, patterns of friendships and social contact, depression in physicians practicing in rural locations, nor the level of isolation felt by physicians practicing in rural locations – the same is true for the spouses of these physicians. All of these are topics for further exploration.

Role of Medical School Admissions and Training Programs in Influencing Specialty and Practice Location

As noted earlier, there are ongoing efforts to demonstrate that beyond the background of the physician, interventions by the government and educational institutions also have an effect on the choice of location and the retention of primary care physicians. Results showing a correlation between rural practice and exposure to rural settings during medical school, internship, and residency are often highlighted to illustrate the effectiveness of a certain program. In his article *Medical education and physician career choices: are we taking credit beyond our due?,* however, Pathman points out that many of these studies share a common shortcoming – that few take into account the "pre-existing characteristics, interests, and career plans of students as they vary across schools and programs, and between participants and non-participants of elective experiences."[xxx] Accordingly, some studies have shown that when medical students/interns/residents are randomly assigned to programs providing rural exposure, there is no significant relationship between exposure and practice location – self selection for these programs has been eliminated.

If we accept this premise, then what are government and universities to do besides offering scholarships, loan forgiveness, grants, and other economic incentives to those individuals committing to serve in an underserved

area? Recognizing that the literature supports the notion that personal characteristics of the physician are currently the best predictors we have, and that students select programs which match their interests, successful efforts have focused on first selecting candidates with a pre-disposition toward rural service (according to such predictors as rural upbringing and intention to pursue a primary care specialty), and then training them appropriately to improve the chances that they do in fact enter, and remain, in rural primary care. Rabinowitz, *et. al* directly attribute the success of the Jefferson Medical College Physician Shortage Area Program to proper selection of candidates.[xxxi]

Predictably then, there has been considerable interest among the states in determining which types of programs to influence physician distribution actually work well. Several recent reports examining state programs, including medical school efforts, have been completed. While these reviews are generally not empirical in nature, they do represent the work of notable organizations and experts in the field. Two important efforts include those by the National Conference of State Legislatures, and the Wisconsin Hospital Association and Wisconsin Medical Society.

Two comprehensive reports comparing the health care workforce of 18 states were produced for the National Conference of State Legislatures by the Health Resources and Services Administration in 2001 and 2002. Comparisons were made of health care workforce education, practice and policy in each state, with a focus on supply and demand, education and practice location demographics, licensure and regulation of practice, and initiatives for the improvement of the practice environment.[xxxii,xxxiii] A summary of those states' health officials' assessment of various initiatives to influence physician distribution is included on the following page in Table III.

The initiatives listed are separate from traditional grant and loan programs offered by almost every state, however, they do include direct and indirect financial incentives to physicians. Among the most widely used are targeted recruitment and placement, support for rural preceptorships and training opportunities, focused recruitment of students from rural and underserved areas, and malpractice immunity when providing free care. It is noteworthy that the highest number of high impact ratings received are by the latter two initiatives.

A March 2004 report recently released by a Task Force of the Wisconsin Hospital Association and Wisconsin Medical Society addresses a generally perceived physician shortage in that state.[xxxiv] Each of the five recommended goals of the Task Force deal directly or indirectly with medical education and training – these goals and select relevant action steps from that report are outlined in Table IV.

A number of medical school programs that have received national attention are highlighted in each of these reports and elsewhere. These programs derive their success from the recognition that the rural background of the physician, and an interest in rural primary care are the currently best understood predictors of rural practice; and that exposure, focused training and continued support of individuals with these characteristics will result in higher than average

placement and retention of physicians in rural areas. Several of these programs are summarized in the following pages.

Table III: Summary of State Recruitment and Retention Initiatives[2]

State Recruitment/Retention Initiative	CA	CT	FL	IL	IA	TX	UT	WA	WV	WI	CO	ME	MN	MO	NM	NY	OH	TN	2001	2002
Focused Admissions/Recruitment of Students from Rural or Underserved Areas	3	-	-	1	-	3	4	3.5	1	-	3	n/a	3	4	-	1	-	-	2.6	3.7
Support for Health Professions Education (stipends, preceptorships) in Underserved	4	-	4	3	-	4	4	3.5	1	2	4	n/a	3	2	3	1	3.5	2	3.2	2.6
Recruitment/Placement Programs for	3	3	3	2	3	2	2	4	1	2	3	n/a	3	-	1	-	n/a	3	2.5	2.5
Practice Development Subsidies (i.e., start-	-	-	-	-	3	2	3	-	new	-	-	-	-	4	-	-	-	4	2.7	4
Malpractice Premium Subsidies	-	-	-	-	3	-	-	-	1	-	-	n/a	-	-	-	-	-	-	2	n/a
Tax Credits for Rural/Underserved Area	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	n/a	1
Providing Substitute Physicians (locum	-	-	-	-	5	4	-	3	new	-	-	-	-	-	2	-	-	-	4	2
Malpractice Immunity for Providing	-	-	1	5	2	new	1	4	-	5	3	-	-	1	-	-	5	4	3	3.3
Payment Bonuses/Other Incentives by Medicaid or Other Insurance Carriers	-	-	-	-	1	-	-	-	-	4	-	n/a	4	-	-	-	-	5	2.5	3
Medicaid Reimbursement of Telemedicine	-	-	-	5	-	-	-	-	4	-	-	n/a	?	-	-	-	-	2	4.3	2

Impact Rating: 1 = high to 5 = low

n/a: program in place but data not

new: program in place but too new to

?: program in place but don't know

[2] Summarized from the National Conference of State Legislatures reports: The Health Care Workforce in 10 States: Education, Practice and Policy, Spring 2001 and The Health Care Workforce in 8 States: Education, Practice and Policy, Spring 2002.

Table IV: Goals and Selected Action Steps of the Task Force on Wisconsin's Future Physician Workforce[3]

Goals	Selected Action Steps Relevant to Medical Education and Training
1. Recruit, enroll and train in Wisconsin's medical schools individuals who are likely to practice in Wisconsin, with particular attention towards underserved parts of Wisconsin.	• Increase the number of students in medical school. • Establish goals for medical school to set and achieve targets for successful recruitment and retention of students from underserved areas. • Create regional specialty training networks to expose trainees to underserved areas. • Develop/replicate programs that attract to medical school, students most likely to practice in underserved areas. • Create a programmatic focus or a "school within a school" to focus on underserved areas. • Start promoting health careers at the middle school level.
2. Develop care delivery models that will enhance and leverage physician resources.	• Prepare medical students and residents to work with advanced practice providers • Investigate potential mentoring opportunities using retired, part-time and administrative physicians. • Evaluate shortening the timeframe for medical education.
3. Create policy and practice that encourages physicians to enter and remain in practice in Wisconsin. Create similar policies to encourage physicians to return to Wisconsin to practice.	N/A
4. Provide for adequate and targeted funding for medical students.	• Increase state funding for medical education • Increase Medicaid GME and tie increases to Task Force goals.
5. Develop and infrastructure to guide medical education policy in Wisconsin.	• Create and maintain adequate data about physician supply and demand.

Illinois

Operating since 1993, the Illinois Rural Medial Education Program (RMED) is a response by the state of Illinois and the University of Illinois College of Medicine at Rockford to address the state's ranking of 46th in terms of population living in underserved areas – 75 of the state's 84 rural counties (out of 102 counties total) are considered primary care shortage areas by the Illinois Department of Public Health.[xxxv,xxxvi] As reported by Stearns, et al., and the NCSL and Wisconsin reports, the mission of RMED is the production of family physicians for these underserved counties.

Candidates must first apply and meet the eligibility criteria of the College of Medicine, then complete a second application to RMED. Candidates are screened according to traditional medical school criteria such as the American Medical College Application Service Personnel Statement, GPA and MCAT scores, and also according to

[3] Summarized from the Wisconsin Hospital Association and the Wisconsin Medical Society March 2004 report "Who will care for our patients? Wisconsin takes action to fight a growing physician shortage" .

criteria known to be related to the practice of primary care in a rural area. RMED considerations include "background in rural underserved Illinois, hometown size of <10,000, and extended family living in rural Illinois. Family practice indicators include initial specialty preference, service orientation, evidence of leadership, family practice role models and broad undergraduate education." A special RMED Retention and Recruitment committee evaluates and ranks the applicants for admission and the results are forwarded to the admission committee.

The RMED curriculum runs in parallel to the regular curriculum of the medical school, and it is designed around the Pathman, *et. al.* categories of physician-community activity:

1. identifying and intervening in the community's health problems;
2. social-cultural awareness in patient care;
3. informed and appropriate use of community health resources, and;
4. assimilation into the community.[xxxvii]

Additional important components of RMED include community orientation in the third year, where students pick their specific preceptorship community and learn community assessment strategies; and a 16-week rural preceptorship and completion of a community-oriented primary care project and community structure study, all in the 4th year. Throughout the program, peer support is formally facilitated by the college.

As of January 2000, the program had graduated a total of 39 students in three classes, 82% of whom entered primary care residencies. At the same point in time, RMED had 83 students at various stages of the four year program, 87% from rural counties and from hometowns averaging less than 7,700 residents.

Pennsylvania

A program with a longer history is Jefferson Medical College's Physician Shortage Area Program (PSAP). Located at Thomas Jefferson University in Philadelphia, PA, the PSAP program was founded in 1974 to produce family practitioners for rural Pennsylvania. Comprehensive data on PSAP students and graduates has been maintained from its inception, allowing its effectiveness over thirty years to be studied and reported on extensively.

As described by Rabinowitz and the Wisconsin report, similar to the RMED program, PSPA relies heavily on recruiting and admitting applicants who have a high probability of practicing Family Medicine in a rural area on a long-term basis – meaning applicants who have grown up in a rural area and express a strong intention to practice rural Family Medicine. While applicants must meet the minimum requirements of the Medical College, the broadening of the evaluation criteria to include predictors of rural family practice results in the admission of applicants who might otherwise be rejected. Study by the college indicates that academic performance of PSAP and non-PSAP students in medical school does not differ.[xxxviii]

The program is comprehensive – it includes strong advising, financial aid (loans) and rural family practice curriculum components. Students have the opportunity for rural clerkships in the summer of years one and two, and

are required to take a rural clerkship and sub-internship in years three and four. At the start of the program, all students sign an agreement that they will complete a residency and practice Family Medicine in a rural area, although there is no formal mechanism to force compliance.

Approximately 12-15 students graduate from the program each year. A 1999 study by Rabinowitz, *et al.* of all physicians practicing in Pennsylvania who graduated from medical school between 1978 and 1991 was conducted to assess the impact of PSAP. Although PSAP accounted for only 1% of all Pennsylvania allopathic medical school graduates between 1978 and 1991, its graduates accounted for 21% of the 150 physicians graduating in this period and practicing in rural Pennsylvania in 1997. Looking at *all* physicians practicing primary care in rural Pennsylvania in 1997, PSAP graduates accounted for 7% of the workforce.

Of the 206 PSAP graduates studied between 1978 and 1991, 68% were practicing in rural areas of the United States in 1997 (versus 11% of all non-PSAP graduates) and 52% were practicing Family Medicine (versus 13% of all non-PSAP graduates). In total, 84% of all PSAP graduates were either practicing in a rural area or in one of the primary care specialties.

Washington

The University of Washington School of Medicine admits students from that state, as well as four western states that are without a medical school: Wyoming, Alaska, Montana and Idaho.[xxxix] Since 1971, this regional partnership, known as WWAMI**,** has worked to establish 75 clinical training sites across the five states, including six AHECs. A 1990 state law provides for preferential medical school admissions to rural students agreeing to practice in rural areas for five years[xl], and several WWAMI programs are designed to expose students to rural practice.

As described by Norris, *et al.*, and the Wisconsin and NCSL reports, these include shadowing opportunities for new students; the Rural/Underserved Opportunities program, a second-year, four to six week preceptorship in communities of less than 9,000 people; the Rural Integrated Training Experience, a third-year, six month rural clerkship; and the SPARX program – Student Providers Aspiring to Rural and Underserved Experiences.

SPARX is unique in that it works to keep those students interested in rural primary care from "straying from the pack" when they are in the urban medical center setting completing their studies and training. It has essentially evolved into a student operated AHEC – organizing educational seminars, field trips, extracurricular activities and networking events. 25% of all recent graduates of the medical school had participated in SPARX, and there is early anecdotal and statistical evidence that those who do so are more likely to choose a primary care residency program. Overall, WWAMI graduates enter family practice residency programs at twice the national average, and 30% of these go on to practice in rural areas.

Minnesota

The University of Minnesota Schools of Medicine in the Twin-Cities and Duluth work together to produce family practice physicians for rural Minnesota and Wisconsin. As described at their web-site, and in the Wisconsin and NCSL reports, the School of Medicine Duluth is a two-year program focused on producing rural family practice physicians – students complete their 3rd and 4th years in the Twin-Cities. 75% of all Duluth graduates practice in Minnesota or Wisconsin, 44% in communities smaller than 20,000 people, and 53% practice Family Medicine.[xli] In addition to selection of students likely to pursue rural family practice, the first two years of experience at the Duluth campus are buttressed with a preceptor program where students live with and shadow a rural family physician several times a year.

Approximately 30 third-year students enter the Rural Physician Associate Program (RPAP) which is a nine-month preceptorship in a community setting. Students are selected for academic ability, maturity, potential to return to rural practice, independence, learning style, goals, interest in research and preference for location.[xlii] Students complete part I of the National Board of Medical Examiners before starting the RPAP, and are required to participate in a number of learning activities such as videotaping of patient encounters, daily reading on problems encountered, self-directed modules on interviewing and behavioral medicine, ACLS and BTLS certification, and so on. Program preceptors are carefully selected, must work in groups of at least two, and be affiliated with an accredited hospital.

By 1985, all 87 counties in Minnesota had a ratio of 1 primary care physician for every 2500 residents. According to the RPAP web page, out of over 900 RPAP graduates, approximately 45% are practicing in Minnesota, 29% in rural areas, and 81% are practicing a primary care specialty.[xliii]

Other Programs

For the sake of brevity, not all programs of note are described in this review. The following list includes additional medical schools and agencies with programs and initiatives designed to increase the number of rural primary care physicians:

- East Tennessee State University College of Medicine, Rural Primary Care Track;
- Mercer University School of Medicine;
- Michigan State University College of Human Medicine Rural Physician Program (RPP);
- State University of New York Binghampton and Syracuse;
- Texas Center for Rural Health Initiatives and the Texas Higher Education Coordinating Board;
- University of Iowa Health Professions Training Program;
- University of Nebraska Medical Center College of Medicine, Rural Health Education Network;
- University of New Mexico School of Medicine;
- University of Tennessee College of Medicine Underserved Areas Program;
- West Virginia Rural Health Education Partnerships and the West Virginia Rural Health Access Program.

Conclusion: Possible Strategies for Louisiana

This paper has attempted to review and summarize the best evidenced based research addressing the problem of primary care distribution in rural areas. In doing so, we have primarily looked at national and international studies to identify current and proposed best practices to address this glaring health manpower dilemma.

The next questions to be addressed by the Task Force will undoubtedly center on the action steps which might be undertaken in the public policy arena of Louisiana. A model for this is the March 2004 report by the Wisconsin Hospital Association and Wisconsin Medical Society titled "Who Will Care for Our Patients?" Examples of pertinent policy questions raised by this study from a slightly larger state with a significant rural population include the:

- Establishment of goals for medical schools to set and achieve targets for successful recruitment and retention of students from underserved areas.
- Creation of regional training networks to expose trainees to underserved areas;
- Development/replication of medical school programs that attract students most likely to practice in rural areas.

Each of these recommendations is consistent with the literature review and the general consensus findings pointing towards successful physician practice in rural areas. The approaches might be studied as possible paths as Louisiana addresses its shortage concerns.

Two more far reaching proposals from the Wisconsin study are also of note. These are geared in one instance towards the medical school curriculum itself, proposing to "create a programmatic focus or a 'school within a school' to focus on underserved areas." The second addresses the stimulation of interest in medical careers at an early stage of student development, commencing as early as middle school for students in underserved areas who might then opt for a career in medicine.

Opportunities for Further Research

Any in-depth review raises as many questions as it attempts to answer, and this review of primary care physician maldistribution is no different. The first is related to the increasing importance of women in the physician workforce. Women now account for more than 50% of all medical school students, and approximately one in every four physicians. As noted earlier, however, they practice primary care in rural areas less frequently than men, even though they are overrepresented in the primary care specialties. Understanding the factors important to a women physician's decision to practice rural primary care is critical if Louisiana and the nation are to increase the overall supply of primary care physicians to underserved rural areas.

The second question is related to the lack of specialist in rural areas. Common sense suggests that this has as much to do with the size of the population necessary to support a specialist as it does with any characteristics of the physician, their education, and the location itself. With the rapid expansion of internet and telemedicine, however, and an increasingly aging rural population that will require more specialty care, further investigation is warranted.

References

[i] Rabinowitz, H., Diamond, J., Markham, F., Hazelwood, C. A program to increase the number of family physicians in rural and underserved areas. Impact after 22 years. *JAMA*. January 20, 1999; 281(3):255-260.

[ii] Fink, K., Phillips Jr., R., Fryer, G., Koehn, N. International medical graduates and the primary care workforce for rural underserved areas. *Health Affairs*. March/April 2003; 22(2):255-261.

[iii] Norris, T., House, P., Schaad, D., Mas, J., Kelday, J. Student providers aspiring to rural and underserved experiences at the University of Washington: promoting team practice among the health care professions. *Academic Medicine*. December 2003; 78(12):1211-1216.

[iv] Lave, JR., Lave, JB., Leinhardt, S. Medical manpower models. *Inquiry*. June 1975, XII: 97-125.

[v] Shihua, P., Geller, J., Muus, K., Hart, G. Predicting the degree of rurality of physician assistant practice location. *Hospital & Health Services Administration*. Spring 1996; 41(1): 105-119.

[vi] Cooper, J., Heald, K., Samuels, M., Coleman, S. Rural or urban practice factors influencing decision of primary care physicians. *Inquiry*. March 1975, XII: 18-25.

[vii] Fryer, G., Meyers, D. Krol, D., Phillips, R., Green, L., Dovey, S., Miyoshi, T. The association of Title VII funding to departments of Family Medicine with choice of physician specialty and practice location. *Family Medicine*. June 2002; 34(6):436-430.

[viii] Rabinowitz, H., Diamond, J., Markham, F., Hazelwood, C. January 20, 1999.

[ix] Dever, A., Eveland, P., Tedders, S., Fehlenberg, R., Laurens, M., Harrelson, J. Impact of a population-based medical curriculum on specialty choice. *Journal of Healthcare for the Poor and Underserved*. 2001; 12(3):261-271.

[x] Council on Graduate Medical Education. 10th Report: Physician Distribution and Health Care Challenges in Rural and Inner-City Areas. February 1998. p. xiii.

[xi] Pathman, et. al. State scholarship, loan forgiveness and related programs. The unheralded safety net. *JAMA*. October 25, 2000. 284(16): 2084-2092.

[xii] Rabinowitz, H.K. The role of the medical school admission process in the production of generalist physicians. *Academic Medicine*. January 1999. 74(1) Supplement: S39-S44.

[xiii] Gang, X., Veloski, J., Mohammadreza, H., Politzer, R., Rabinowitz, HK., Rattner, S. Factors influencing primary care physicians' choice to practice in medically underserved areas. *Academic Medicine*. October Supplement 1 1997; 72(10): S109-S111.

[xiv] Stearns, J., Stearns, M., Glasser, M., Londo, R. Illinois RMED: A comprehensive Program to Improve the Supply of Rural Family Physicians. *Family Medicine*. January 2000; 32(1): 17-21.

[xv] Steele, M., Schwab, R., McNamara, R., Watson, W. Emergency medicine resident choice of practice location. *Annals of Emergency Medicine*. March 1998; 31(3):351-357.

[xvi] Carter, R. The relation between personal characteristics of physicians and practice location in Manitoba. *Canadian Medical Association Journal*. February 15, 1987; 136:366-368.

[xvii] Laven, G., Beilby, J., Wilkenson, D., McElroy, H. Factors associated with rural practice among Australian-trained general practitioners. *Medical Journal of Australia*. July 21, 2003; 179:75-79.

[xviii] Leonardson, G., Lapierre, R., Hollingsworth, D. Factors predictive of practice location. *Journal of Medical Education* . January 1985; 60:37-43.

[xix] Cooper, J., Heald, K., Samuels, M., Coleman, S. March 1975.

[xx] Rabinowitz, HK., Diamond, J., Veloski, J., Gayle, J. The impact of multiple predictors on generalist physicians' care of underserved populations. *American Journal of Public Health.* August 2000. 90(8):1225-1228.

[xxi] Rabinowitz, HK., Diamond, J., Markham, F., Paynter, NP. Critical factors for designing programs to increase the supply and retention of primary care physicians. *JAMA.* September 5, 2001. 286(9):1041-1048.

[xxii] Cantor, JC., Miles, EL., Baker, LC., Barrer, DC. Physician service to the underserved: implications for affirmative action in medical education. *Inquiry*. Summer 1996. 33:167-180.

[xxiii] Ricketts, TC., Konrad, TR., Wagner, EH. An evaluation of subsidized rural primary care programs: II The environmental contexts. *American Journal of Public Health.* April 1983. 73(4):406-413.

[xxiv] Cooper, J., Heald, K., Samuels, M., Coleman, S. March 1975.

[xxv] Carter, R. February 15, 1987.

[xxvi] Laven, G., Beilby, J., Wilkenson, D., McElroy, H. July 21, 2003.

[xxvii] D'Elia, G., Johnson, I. Women physicians in a non-metropolitan area. *Journal of Medical Education*. July, 1980. 55:580-588.

[xxviii] Mitka, M. What lures women physicians to practice medicine in rural areas? *JAMA*. June 27, 2001. 285(24):3078-3079.

[xxix] Ellsbury, K.E., Baldwin, L., Johnson, K.E. Runyan, S.J., Hart, G.L. Gender-related factors in the recruitment of physicians to the rural northwest. *Journal American Board of Family Practice.* September-October 2002. 15(5):392-400.

[xxx] Pathman, D. Medical education and physician career choices: are we taking credit beyond our due? *Academic Medicine* . September 1996; 71(9):963-968.

[xxxi] Rabinowitz, H., Diamond, J., Markham, F., Hazelwood, C. January 20, 1999.

[xxxii] National Conference of State Legislatures. The health care workforce in 10 states: education, practice and policy. Spring 2001.

[xxxiii] National Conference of State Legislatures. The health care workforce in 8 states: education, practice and policy. Spring 2002.

[xxxiv] Wisconsin Hospital Association and the Wisconsin Medical Society. Who will care for our patients? Wisconsin takes action to fight a growing physician shortage. March 2004.

[xxxv] Stearns, J., Stearns, M., Glasser, M., Londo, R. January 2000.

[xxxvi] Wisconsin Hospital Association and the Wisconsin Medical Society. March 2004.

[xxxvii] Stearns, J., Stearns, M., Glasser, M., Londo, R. January 2000.

[xxxviii] Rabinowitz, H., Diamond, J., Markham, F., Hazelwood, C. January 20, 1999

[xxxix] Norris, T., House, P., Schaad, D., Mas, J., Kelday, J. December 2003.

[xl] National Conference of State Legislatures. The health care workforce in 10 states: education, practice and policy. Washington. Spring 2001.

[xli] Wisconsin Hospital Association and the Wisconsin Medical Society. March 2004.

[xlii] Verby, J.E., Newell, J.P., Anderson, S.A., Swentko, W.M. Changing the medical school curriculum to improve patient access to primary care. *JAMA*. July 3, 1991. 266(1):110-113.

[xliii] www.rpap.umn.edu