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A Comprehensive Medical Education Program Response to Rural Primary Care Needs

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Abstract

This article presents the characteristics and results of the Rural Medical Education (RMED) Program which addresses medical workforce needs focused on reducing rural health disparities. The program is comprehensive in implementing a system of recruitment of candidates from rural backgrounds, offering a rural-focused curriculum, and instituting evaluative components to track outcomes. Distinctive program features include a Recruitment and Retention Committee of rural community members; special rural-focused topics and events during the first three years of undergraduate medical education; and a required fourth-year, 16-week rural preceptorship through which students work with primary care physicians and conduct community-oriented primary care projects.

Since 1993, 216 students have matriculated. More than three quarters of candidates interviewed received offers into the program (overall acceptance rate of 75%). Comparisons between RMED and all other students on composite MCAT scores and United States Medical Licensing Examination (USMLE) Part 1 scores show a slightly lower MCAT average for RMED students, but USMLE scores are equal to those of non-RMED students. To date, 159 students have graduated, with 76% entering primary care residencies; 103 are currently in practice, with 64.4% in primary care practice in small towns and/or rural communities. RMED Program outcomes compare favorably with those of other rural medical education programs.

RMED can serve as a model at many levels, including recruitment, collaboration, curriculum, and retention. Future challenges for program development and disparity reduction include recruiting students from the growing number of rural minority populations, expanding the number of

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program slots, and integrating the program with other health professions to address the needs of rural populations.

The needs for increased numbers of physicians and other health professionals in rural communities and for greater attention to rural disparity reduction are well documented and continue to be issues of national, as well as international, importance.¹⁻⁵ Strategies advocated and implemented in response to rural workforce disparities resulting from physician maldistribution include employing international medical graduates as a source of primary care physicians in rural areas;⁶ offering financial incentives, in the form of scholarships and loan repayment mechanisms, to medical graduates to encourage practice in rural and underserved areas;^{7,8} developing medical education programs that offer special curricula, including immersion into the rural community and emphasizing rural practice and preparation for careers in rural medicine;⁹⁻¹¹ creating programs that focus on the early identification and recruitment of medical students who will be more likely to pursue medical careers in rural areas;^{12,13} and implementing approaches that combine strategies through attention both to recruitment and curriculum.¹⁴⁻¹⁶

Brooks et al¹⁶ report that the two major premedical school factors associated with practice in rural communities are a rural upbringing and an expressed plan to eventually become a family physician. From an economic and logistical perspective, primary care physicians, rather than specialists, are more able to sustain viable practices in less populated areas, such as rural communities.¹⁷ Glasser et al,¹⁸ in a study of rural hospital chief executive officers' perceptions of health professions needs in their communities, found that 19 of 22 (86%) reported physician shortages in their geographical areas, and most often mentioned, in terms of specialty need, was family medicine (64%).

Overall, major issues in rural workforce training and retention include

- the relative impact of the size of a student's hometown on his or her final practice site selection¹²;
- the relative impact of rural rotations in medical school and residency on practice and retention in rural areas¹⁹;
- the medical school, institutional, and societal commitment to rural medical education and rural disparity reduction⁴⁻²⁰; and
- the longitudinal tracking and the examination of the long-term impact of rural strategies and programs on rural practice recruitment and retention.²¹

In this article, we describe a comprehensive program, the Rural Medical Education (RMED) Program, designed to recruit and encourage placement of primary care physicians in rural areas. We describe the program's origins and institutional context and provide numerous outcomes, including lessons learned and how we are translating these lessons into new program initiatives, activities, and directions.

Program Background

Overview

RMED is one of the major programs of the National Center for Rural Health Professions (NCRHP), an interdisciplinary center located at the University of Illinois in Rockford, with a mission of promoting the health of rural communities through partnerships in education, service, research, and policy. In 1990, the Illinois Rural Downstate Health Act formally established the RMED Program to improve access to health care services in rural, downstate, and shortage areas of Illinois. RMED is an evidence-based program that resulted

from discussions among faculty and our understanding of other rural-oriented programs in place at the time.^{10,22–26} A family physician with a background in rural medicine directs the RMED Program, which receives recurrent funding of about \$550,000 per year from the state of Illinois. Funding covers major elements of the program including the identification and recruitment of potential RMED Program students; the development, implementation, and maintenance of a targeted rural curriculum; faculty development for rural preceptors; and program evaluation at multiple levels. Various faculty members (approximately five FTE) have full- and part-time responsibilities in these component areas. Importantly, there is a full-time position dedicated to the recruitment process. Among other responsibilities, the RMED recruiter makes yearly trips to feeder schools (12 to 14 Illinois colleges and universities from which the majority of students have applied and been accepted into the RMED Program) to meet with sophomore, junior, and senior students who have a potential interest in rural medicine.

Recruitment and admissions

The charter class of Illinois RMED entered the program in 1993, after a little more than two years of planning, traveling to rural communities to meet with physicians and hospitals to discuss partnerships, developing curriculum, and implementing a recruitment process. RMED can admit 15 to 20 students per year, who pledge to return to Illinois on completion of their residencies to practice primary care medicine. The pledge is not legally binding, but it does serve to reinforce a commitment within the students to the practice of rural medicine.

Students applying to the RMED Program participate in a dual application process, by which candidates apply to both the University of Illinois College of Medicine (COM) and the RMED Program. Although it is essential to complete the RMED application²⁷ and review process, the timing and objectives of the RMED and COM processes are not always in sync. Candidates must apply to the program by late fall of each year, which means completing an RMED application form (http://www.ncrhp.uic.edu/admissions/RMED_application.pdf), providing three reference letters from the applicant's rural home community, and completing the COM application along with its American Medical College Application Service requirements.

RMED screeners, consisting of local faculty, meet during November and early December to review completed applications. They identify potential candidates on the basis of academic performance as well as merit and compatibility with the RMED Program qualifications, including rural background, leadership experience, community involvement, and expressed commitment to rural primary care. The RMED screeners invite candidates who meet the criteria to an interview with the RMED Recruitment and Retention (R&R) Committee in late January at the Rockford campus. The R&R Committee is a special admissions committee made up of rural health professionals and community members from various geographic locations in Illinois, as well as current RMED student representatives. The committee is charged with creating a list of 20 to 25 candidates who, in the committee members' collective view, are likely to pursue careers as rural primary care physicians. The RMED Program extends offers to desirable candidates within one week of the committee interviews and recommends these candidates to the University of Illinois COM Admissions Committee, which must give the final approval. RMED students represent about one third (15 to 20 students) of the total yearly class of 50 students at the Rockford campus. To date, 216 students have matriculated into the RMED Program.

Curriculum

The RMED Program students complete all the coursework required of University of Illinois medical students but, in addition, participate in an add-on curriculum consisting of monthly

sessions during the first three years (M1, M2, and M3) of medical school and a capstone requirement in the fourth year (M4).

The curriculum is based on observations of other rural medical education programs as well as extensive discussions with medical and public health educators. A key concept, given the rural physicians' close ties to the community, is the integration of clinical medicine and population health. The program rationale reflects the core components identified in Pathman and colleagues²⁸ examination of community dimensions of primary care practice. From the M1 to the M4 year, the curriculum progresses through community and population health; health care delivery in rural communities; understanding and developing a community-oriented primary care (COPC) project; and immersion in a rural community and primary care practice.

Topics covered during the M1 year are population-based approaches to rural health care, agricultural hazards and farm safety, the development of health resources in rural communities, rural mental health issues, and community-based rural health research. Topics covered during the M2 year comprise chronic disease management in rural Illinois, rural clinical cases discussion, complementary and alternative medicine, annotated bibliography on rural health issues, and introduction to community-oriented primary care (COPC). Finally, the M3 year topics are introduction to Community Project Resource Book and Community Structure Project, perspectives on practice location and practice arrangement decisions, ethical dilemmas in rural practice, coding and optimized reimbursement, the institutional review board (IRB) process, and COPC work sessions.

In years M1 and M2, there are also field trips and special events (e.g., "Southern Exposure;" the "No Harm on the Farm" tour; and the Illinois Rural Health Association meeting) to provide students with the opportunity to directly observe and participate in communities and organizations related to rural health. RMED Program faculty grade the courses on a pass–fail basis, and the course grades are part of the students' final medical school transcripts. A faculty member or community member who has expertise on the particular topic area teaches each of the sessions. After each session, the students break into assigned groups and complete a written synopsis of the session in which they respond to specific questions regarding interpretation and application of the material they have learned.

The third-year curriculum serves primarily as preparation for the fourth-year, 16-week preceptorship in a rural community. Students select one of 25 rural communities for the preceptorship (see Figure 1). For each site, the local hospital has agreed to provide room and board for the student as well as a primary care physician, whom the university has screened and credentialed, to serve as preceptor—that is, teacher, mentor, and advisor.

All but 1 of the 35 available preceptors are family physicians (the one exception is a general internist), and all have adjunct faculty appointments. Once a student's preceptorship site has been agreed on, the student contacts the preceptor's office for approval of the time for the 16-week block.

For the student, this selection process involves negotiating a number of considerations, including the characteristics of the targeted community, preceptor and hospital profiles (e.g., practice size, patient demographics, the number of physicians active in the delivery of obstetrics–gynecology), family obligations influencing the ability to locate farther away from Rockford, and the desire to locate close to one's hometown. In addition to site selection, by the end of the M3 year, each RMED student will have completed his or her IRB certification, developed a COPC project abstract, visited the preceptorship community, and completed a draft of the COPC proposal for review by his or her faculty advisor and the IRB committee.

The M4 year rural preceptorship consists of 16 weeks during which the student lives in a rural community, works with a primary care physician, and completes a COPC project. The students devote approximately 70% of their time during the preceptorship to clinical aspects of rural primary care in both the office and hospital settings. Students spend the vast majority of their time with the primary preceptor, but the program also encourages them to spend, on average, one half day per week working with other health care providers in the community. Depending on a student's interest and the expertise available in the community, this might mean working in the emergency department, with a cardiologist, a surgeon, etc. Some students have also opted to spend time at the local health department or learning from such providers as physical therapists or social workers. The split in the student's time between the hospital and the primary care clinic varies according to both the focus of the practice and the emphasis of the respective preceptors. To facilitate the monitoring of their experiences at each location, the students are responsible for logging at least 250 patient encounters during the preceptorship block. They enter data onto a password-protected Web site (with patient information decoded) delineating patient complaints, diagnoses (using International Statistical Classification of Diseases and Related Health Problems), codes, patient demographics, procedures, and referrals.

Before the preceptorship, students also complete two surveys—one that addresses their goals and expectations for the 16-week rotation and one that assesses their self-reported skill level on 97 items representing 11 health care components:

- common undifferentiated problems
- common acute problems
- common chronic problems
- delivery of health maintenance
- provision of patient education
- utilization of consultation
- procedures
- primary care preceptor office structure
- hospital care system
- other health care systems
- general community characteristics

The RMED Program shares both assessments with the preceptor immediately before the student's arrival in the community. Then, on completion of the rotation, students and preceptors assess the students' abilities in skills and knowledge, and preceptors grade the students' performance in relation to eight components assessed for all clinical rotations at the medical school: history taking, the doctor–patient relationship, chart notes, self-directed learning, physical examination, anticipatory health care, clinical reasoning, and therapeutic management.

The remaining 30% of the capstone preceptorship focuses on each student's completion of a COPC project.²⁹ Projects are predicated on the principle of service learning.^{30,31} Students identify a health need or issue in their rural preceptorship community and develop a project that addresses the issue at some level of the COPC process (i.e., needs assessment, implementation, evaluation). In this context, the students not only learn about the community, the denominator in rural health care delivery, but also give something back to the community over the course of the preceptorship. Projects cover a large scope of issues,

including smoking prevention, farm safety, health promotion related to breast and prostate cancer awareness, support groups for chronic disease management, disease prevalence, and gaps in health care delivery. To date, students have conducted 159 projects in the preceptorship communities.

Overall, in relation to the literature describing initiatives to address rural medical shortages, the RMED Program is comprehensive in nature, with a focus on recruitment, a rural curriculum, and an evaluative component. It is located in a medical school environment that is not exclusively rural in focus but that, relative to other schools in the country, has a generally high proportion of students going into primary care residencies. A long-term objective of the RMED Program from its onset has been to retain physicians in rural areas.

Outcomes

Recruitment and admissions

Results of the recruiting process from completed applications to admission into the RMED Program (1993–2007) are presented in Table 1. Since 1994, the number of completed applications to the RMED Program has decreased, ranging from 32 to 39 during the last four years, with highs of 84 in 1996 and 1997 and 85 in 2002. We have attributed this drop in total number of applications to a number of factors including a greater specificity (and understanding by applicants) of the goals of the RMED Program and a general decrease in medical school applicants' interest in programs targeting careers in family medicine and primary care. Nevertheless, although the total number of completed applications has dropped over the years, there is some indication that the quality of the applicant pool has greatly improved, with candidates showing greater evidence of rural backgrounds and orientation, resulting in greater efficiency in the applicant review process. To illustrate, when the number of completed applications reached its all-time high of 85 in 2002, the screening committee eliminated more than one half of the applications because the candidates, on paper, showed little interest or inclination toward a commitment to rural medical care. In contrast, most recently, nearly 75% of candidates with completed applications were recommended for interviews.

In 1993, the kickoff year of the RMED Program, we recruited a pilot group of students from a base of 12 recommended for interview. The lowest number of applicants recommended for interview, 22, occurred in both 2003 and 2006; the highest number of recommendations, 34, was in 1995. Other than in these three years, the number of applicants recommended for an RMED interview has been fairly constant. Over the years, in all cases, the RMED R&R Committee has interviewed all applicants recommended by the RMED screeners for interview.

Offers by the program to those applicants interviewed have fluctuated from 6 (50%) for the pilot class in 1993 to 20 (91%) in 2003. Each year from 2003 through 2007, more than three quarters (76%–91%) of candidates interviewed by the R&R Committee have received offers to participate in the RMED Program. This generally indicates a level of similarity or correspondence between the perspectives of the screeners and R&R Committee members as to what constitutes a desirable and qualified RMED student. Particularly in the earlier years of the program, there seemed to be more variability in the viewpoints of the two committees.

Also, as presented in Table 1, other than the pilot class of 1993 and the relatively smaller class admitted in 2004, the RMED class size has ranged between 14 and 20 students. The proportion of students accepted by the program and admitted to the COM has ranged from 50% (2004) to 100% (1996). From 1993 to 2007, the average acceptance rate has been 75%.

At times, we have compared RMED students with the remainder of the COM at Rockford student body related to academic credentials and performance. For instance, two years ago we examined four classes' entry MCAT scores and summary measures of cognitive characteristics. Table 2 shows the results of a comparison between RMED and all other Rockford medical students. RMED students tend to score lower than the remainder of the classes as a whole, particularly on the MCAT. This is not surprising, given the smaller communities, often with more limited educational resources, from which the RMED Program students originate.

For the same time period, we examined United States Medical Licensing Examination (USMLE) Part 1 performance for the Rockford medical student body. Mean scores were nearly equal when comparing RMED students in particular with the remainder of the Rockford students. Further, during the past five years, we have examined RMED student outcomes related to awards and recognition at the time of graduation. From 2003 through 2007, students have earned 131 awards, including Alpha Omega Alpha honor society recognitions, research scholarships, and recognition for excellence in specialties such as family medicine, internal medicine, pediatrics, obstetrics–gynecology, and surgery. During this period, RMED students have received 63 (48%) of the awards while, on average, comprising only one third or less of the Rockford student body. Given the opportunities, graduates of the RMED Program have shown that they cannot only meet the demands of, but excel in, medical school.

Pipeline

However, in recent years, we have noticed from trends in applications and overall interest by potential students in rural primary care, as well as primary care in general,³² that the recruitment process cannot be limited to focusing on college-level students and our feeder schools. Responses in line with the Health Careers Opportunity Program, a federal initiative to promote health careers, are important in focusing on the early identification and development of students from rural and underserved backgrounds who are qualified and will enter programs like RMED. Curran and Rourke³³ point out that institutions must develop outreach programs that address increasing awareness of medical careers among rural high school students. Preliminary data indicate that students involved in outreach programs targeted to health professions awareness and education make earlier career choices as well as more informed choices.³⁴ The RMED Program has responded by working collaboratively with partners to develop a pipeline of students with rural roots.

For instance, in conjunction with the University of Illinois Extension service and its 4-H Program, and with support from a grant from Archer Daniels Midland, we offer a “4-H Health Jam.” This is targeted to fourth- and fifth-grade students from rural schools and consists of an overnight stay at a camp followed by a visit to a local hospital. Students learn about health and healthy choices (nutrition, physical activity, mental health) and participate in hands-on learning (e.g., using pestles and bowls to compound medicine, listening to heart beats and taking blood pressure, and replicating pressure concepts related to lung function) conducted by medical, pharmacy, nursing, and dentistry students. They also participate in a half-day tour of a rural hospital, learning about health care and health professions related to emergency medicine, dietetics and nutrition, emergency care, physical therapy, radiology, and public health. Additionally, with support from the local Area Health Education Center and the Center for Rural Health of the Illinois Department of Public Health, we offer a careers camp yearly to high school students, consisting of a two-and-one-half-day stay at a local university. About 50 high school sophomores each year learn about health careers and college life in general. The most recent camp included a simulation of a health care emergency involving fire, police, and emergency medical service support along with a simulation of an emergency room follow-up involving a faculty health professions team.

Health professions students, serving as camp counselors, also hold a panel discussion on health career choices and academic requirements of their respective professions. A key feature of the careers camps is including parents in various activities to inform them and promote communication about health careers between the parents and the rural high school students.

Curriculum

Findings from the analysis of students' self-assessed skills before and on completion of the 16-week preceptorship show very positive outcomes.³⁵ Students consistently rate their skill development as positive, with major gains made in the areas of understanding the primary care office structure, ancillary health care systems, the hospital care system, and the general community. The rural preceptors' evaluations of student performance at the end of the 16 weeks are similarly positive. In fact, the preceptors, on average, rate the students more highly than do the students themselves on all 11 health care components, with the highest ratings in the areas of chronic disease management, provision of patient education, and use of consultation. Overall, the students' and preceptors' evaluations provide evidence of the significant benefit of the 16-week experience related to clinical and professional skill development.

As mentioned, RMED students have conducted 159 COPC projects in 25 rural communities throughout the state of Illinois. The projects fall into four general categories or themes: health education/health promotion, health care utilization, illness/disease, and environment and community (see Table 3). The majority of projects (62, 39%) fall into the health education/health promotion category, followed by environment and community (52, 33%). There has not been a lot of variation in project theme by students' gender, but there has been some tendency for students entering primary care residencies to complete more projects in the area of health education and health promotion—perhaps in line with a generalist perspective in health care delivery. Consistent with this perspective, students entering primary care have been considerably less likely to conduct COPC projects reflecting the themes of health care utilization and illness/disease in rural communities.

A challenge has been getting COPC project results back to the respective communities. The majority of projects are finalized when students return to the Rockford campus to prepare their project findings for the annual Rockford COM Research Day. Currently, returning to the preceptorship community to report and share final project results is difficult for students. One response has been to post the students' projects on the NCRHP Web site, allowing community participants and others to access COPC project summaries in the form of PowerPoint presentations. However, in other cases, a distinct outcome of the project has been to convene community members to review and discuss project findings (e.g., to discuss how a program targeted at reducing violence in youth can be continued by the local health department, to create a special committee on rural mental health to discuss strategies in suicide prevention, and to meet with the local agency on aging to develop a base of support for continuing an aqua-aerobics program for seniors).

Some students have also had the opportunity to communicate the results of their projects beyond the local community and university levels. Among the numerous forums in which RMED students have presented COPC project results are the annual meeting of the Illinois Rural Health Association, the predoctoral and annual meetings of the Society of Teachers of Family Medicine, the international conference of the Network: Towards Unity for Health (an international society focused on partnerships between communities and academic institutions to address health and health education issues), and the National Rural Health Association. In 2007, one RMED student's poster presentation entitled "Impact of perceived barriers on diabetes self-management in rural primary care patients" was selected as the

overall research award winner in a national forum, at the annual meeting of the National Rural Health Association. In some cases, students have taken up projects already started by another student and continued to the next stage, resulting in a continuing focus on the targeted health care issue in the community. A goal for our program as a whole, yet to be implemented, is to revisit the COPC projects in the respective communities in which students have conducted projects and to look at possible long-term outcomes.

Residency and rural practice

We are at a point in the development of the RMED Program at which we can begin to look at overall outcomes in relation to program graduates' residency specialty choices and postresidency practice location decisions, as well as retention in rural areas. From the program's inception, we have maintained a database on RMED applicants and matriculants. Information in the database comprises demographics, each student's hometown at the time of matriculation, year of entry into medical school, year of graduation, location and specialty of residency, year of graduation from residency, location of initial practice, and notes on changes in practice location. A statistical clerk maintains the database and updates it on a yearly basis. The RMED Program uses the data to report outcomes related to the areas of recruitment, residency selection, and rural practice and retention. Since 1993, 159 students have graduated from the RMED Program, 69 (43%) female and 90 (57%) male.

Residency specialty choices—The majority of the 159 RMED graduates (121, 76%) have entered primary care residencies: 99 (62%) family medicine, 8 (5%) general internal medicine, 8 (5%) medicine/pediatrics, and 6 (4%) pediatrics. If the five students entering obstetrics–gynecology are included in this total, 126 (79%) of graduates have gone into primary care residencies. There has been fluctuation in the proportion of graduates going into primary care residencies from the initial graduating class in 1997 to the present. All four members of the pilot group of students selected family medicine residencies (one student from this pilot class decompressed into the second class of RMED students; this student also selected a family medicine residency). Three classes fell below 70% going into primary care residencies: 2005 (57%), 2002 (60%), 2003 (67%). Other than these, all classes have been above 70% primary care, with the last two classes (2006 and 2007) at 94% and 100%, respectively. Although it is not clear why the classes of 2002 and 2005 dropped to 60% or fewer opting for primary care, we should note that this was a time of transition in the position of recruitment directorship in the RMED Program.

Still, the RMED Program accounts for the majority of COM at Rockford graduates who go into family medicine. During the past five years, outcomes are as follows: in 2003, 8 of 9 (89%) of Rockford graduates going into family medicine were RMED students; in 2004, 7 of 7 (100%); in 2005, 6 of 7 (86%); in 2006, 12 of 14 (86%); and in 2007, 9 of 10 (90%). In all, during this time period, 89% of Rockford graduates electing family medicine residencies have been RMED Program students.

Practice location decisions and retention—Of the 159 RMED Program graduates, 103 (65%) are currently in practice. Eighty-five (82.5%) of these 103 are in primary care practice—88 (85.4%) if obstetrics–gynecology is included in the total. Further, 69 (67%) of these graduates have gone into primary care practice in towns of 20,000 people or fewer, or they practice in communities classified according to Rural–Urban Commuting Area (RUCA) codes³⁶: 64 (62.1%) practice in communities meeting small town and rural criteria—with a RUCA score of four and higher. Overall, not only do RMED Program graduates go into primary care specialties at a high rate, they are also highly likely to locate into rural areas. Figure 2 presents a breakdown of practice locations by county in Illinois as well as the distribution of RMED Program graduates across the United States.

These data compare favorably with results from other programs. Other programs' outcomes include the University of Minnesota Rural Physician Associate Program, 64% of whose graduates are in family medicine and 74% in primary care; the University of Washington School of Medicine WWAMI Program (Washington, Wyoming, Alaska, Montana, and Idaho), 61% of whose graduates are in primary care; the Jefferson Medical College Physician Shortage Area Program, 52% of whose graduates have gone into family medicine; and, finally, the University of Minnesota at Duluth, 52% of whose graduates have gone into family medicine.¹⁴

Beyond this, there is the question of the likelihood that these graduates will remain in rural practice. Given the relatively young nature of the program, the answer to this question is not definitive, but there is some evidence related to the issue of retention. For all graduates in practice, 84 of 103 (82%) have stayed at their original practice site. For those in practice for three or more years and in primary care, 45 of 57 (79%) have remained in their initial practice community. In addition, eight graduates with three or more years in primary care practice have relocated to rural communities, returning to Illinois from such states as Indiana, Colorado, and Montana.

In Sum

We have provided a detailed description of a program focused on reducing rural health disparities by preparing physicians for the practice of primary care in rural locations. The RMED Program places dual emphases on the process of student recruitment and on a special rural, community-based curriculum. It also emphasizes data collection and evaluation of both the program process and outcome variables.

There is a strong record for recruiting rural youth, and programs have been put into place for increasing the awareness of youth, family members, and educators related to the need for—and possibilities of—careers in rural health professions. Collaboration continues to be a central element of the program as exhibited in such relations as the ongoing support of hospitals and physicians in 25 rural communities; the geographically and occupationally diverse R&R Committee; cooperative efforts between RMED and organizations like Extension, 4-H, and the Illinois Department of Public Health; the involvement of community leaders and local health care and social service providers in the RMED Program curriculum in years 1 through 3; and the participation of numerous agencies in rural communities in the successful completion of RMED students' fourth-year COPC projects. After their 16-week preceptorship, students report satisfaction with the experience and increased knowledge and skills related to medical and health care delivery. Rural preceptors indicate positive outcomes in students' skills and performance. Finally, RMED students are highly likely to enter primary care practices in rural communities. In this regard, outcomes of the RMED Program compare very favorably with other programs in the country.

One limitation of our program review is that we have not yet collected data regarding RMED students' performance on the USMLE Part 2. However, again, RMED preceptors highly rate RMED student skill acquisition in the fourth year, and our students garner a major share of performance-based awards at graduation.

A second limitation of our review is that it focuses on the experiences of a single program. On the other hand, we are able to provide multiple levels of information on a comprehensive program that has been in existence since 1993. The data indicate that (1) the program successfully identifies and recruits students who have an expressed interest in rural primary care and that (2) we have developed and implemented a program that maintains students' and graduates' affinity towards rural primary care practice, increases knowledge and skills in this area, and influences decisions of physicians to locate and stay in rural communities.

There are still numerous projects and activities to address. First, in relation to the long-term impact of the program on rural communities, we should conduct a follow-up study related to community awareness and follow-through on COPC projects. Second, as the demographics of rural Illinois continue to change— particularly with a large influx of Hispanic and Latino residents—the program needs to develop strategies for forming partnerships that will encourage these youth to be aware of and prepare for rural health professions careers. Third, there is the ongoing challenge within the university to allow additional seats in the first-year class specifically designated for RMED students. The need in rural areas is evident; the university, through its medical school, must continuously take steps to address this challenge in response to the growing need.

The RMED Program faculty and staff have become a part of various networks aimed at teaching and promoting rural physician development. They have shared, via face-to-face meetings, lessons learned and experiences of the program, or best practices, with other medical schools across the nation and even internationally. Additionally, others in Illinois have discussed RMED as a model in relation to the planning and development of rural health education in such other health professions as dentistry and pharmacy— possibly creating RDENT and RPITARM programs, respectively. Overall, RMED Program outcomes provide a positive response to the question posed by Pathman et al¹⁹ as to whether rural-focused medical initiatives can prepare rural physicians in ways able to influence their retention in rural settings.

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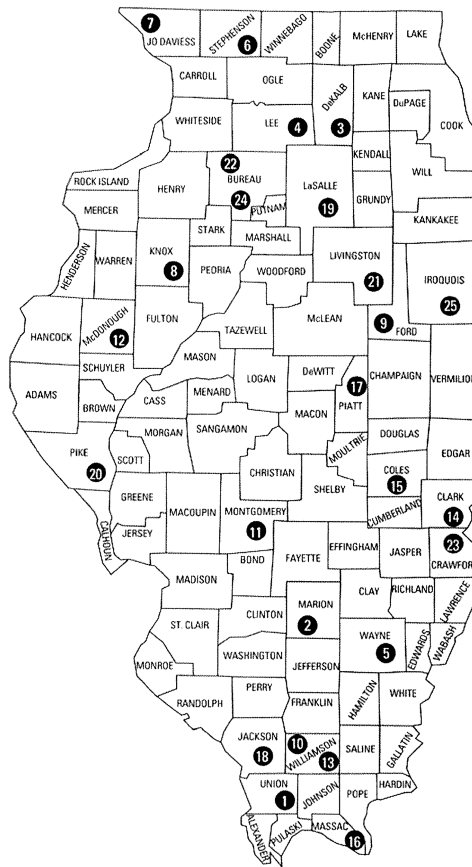


Figure 1.

Rural Medical Education (RMED) Program Preceptorship Sites (Source: RMED Program file). The location (city) names by number are 1. Anna, 2. Centralia, 3. DeKalb, 4. Dixon, 5. Fairfield, 6. Freeport, 7. Galena, 8. Galesburg, 9. Gibson City, 10. Herrin, 11. Litchfield, 12. Macomb, 13. Marion, 14. Marshall/Terre Haute, 15. Mattoon, 16. Metropolis, 17. Monticello, 18. Murphysboro, 19. Ottawa, 20. Pittsfield, 21. Pontiac, 22. Princeton, 23. Robinson, 24. Spring Valley, and 25. Watseka.



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Table 1
Rural Medical (RMED) Program, University of Illinois (U of I) College of Medicine (COM) Data on Applications, Interviews, and Acceptances, 1993-2007

Year admitted	Completed application	No. recommended for interview	No. interview	No. offered RMED slot [*]	No. admitted to U of I COM [†]	No. accepted RMED offer [‡]
1993	18	12	12	6(50)	5(42)	5(83)
1994	46	25	25	20(80)	17(68)	17(85)
1995	59	34	34	20(59)	17(50)	17(85)
1996	84	31	31	20(65)	20(65)	20(100)
1997	84	31	31	23(74)	16(52)	16(70)
1998	75	32	32	22(69)	17(53)	17(77)
1999	62	32	32	25(78)	20(63)	20(80)
2000	54	31	31	23(74)	16(52)	16(70)
2001	76	32	32	23(72)	18(56)	16(70)
2002	85	30	30	NA	16(53)	16(NA)
2003	51	22	22	20(91)	20(91)	15(75)
2004	32	25	25	22(88)	20(80)	11(50)
2005	38	28	28	23(82)	21(85)	14(61)
2006	30	22	22	17(77)	17(77)	14(82)
2007	39	29	29	22(76)	21(72)	14(64)

^{*} Percentage of applicants interviewed who were given an RMED offer.

[†] Percentage of applicants interviewed who were accepted to U of I COM.

[‡] Percentage of applicants who accepted RMED offer.

NA, not available.

Table 2
A Comparison of MCAT and Cognitive Characteristic (CC) Scores for Rural Medical Education Students (RMED) and All Other Students at the University of Illinois (U of I) College of Medicine (COM), Rockford

Class	RMED students		All other of U of I COM, Rockford students	
	MCAT	CC	MCAT	CC
1	8.13	61.66	9.35	65.03
2	8.83	63.90	9.13	64.56
3	7.87	62.70	9.18	65.18
4	8.07	62.55	8.94	64.50

Table 3
Rural Medical Education (RMED) Program Students' COPC Projects, by Theme, Primary Care Graduates, and Student Gender (n = 159)

project themes	No. (%) total projects	No. (%) graduates in primary care	No. (%) women
<i>Health Education/Health Promotion</i> (e.g.: Farm Safety Day; Blood Pressure Screening in Bureau County, IL; Macoupin County Kids Against Tobacco; Diabetes Care in A Rural Area; On the Run: Food and Fitness)	62 (39)	52 (43)	28(41)
<i>Healthcare Utilization</i> (e.g.: Rural Emergency Room Visits and Required Resources; Increasing Immunization Access and Adherence in a Rural Community; The Use of Herbal Medicine in a Rural Community; Access and Barriers to Prenatal Care in a Small Midwest Community; Barriers to Diabetes Care in Metropolis, IL)	19(12)	16(13)	10(15)
<i>Illness/Disease</i> (e.g.: Dermatological Problems in Rural Primary Care Practice; Depression and Chronic Disease; Congenital Anomalies in Ford/Iroquois County; Smoking Patterns Among High School Freshman; Heart Disease in Women)	26(16)	16(13)	12(17)
<i>Environment and Community</i> (e.g.: Domestic Violence and Community Response; Study of Infiltrates in the City of Marseilles, IL Waste Water Treatment Plant; Public Awareness of Melanoma; Determinants of Food Choice Among the Poor; Women of Bureau County: Health Prevention and Obesity)	52 (33)	37(31)	19(28)