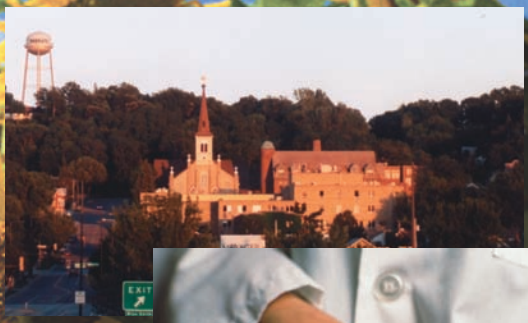
RMJ

Rural Minnesota Journal



RMJ

Rural Minnesota Journal

Examining Rural Health Care

Spring 2007

CENTER *for*
RURAL POLICY
and DEVELOPMENT
Seeking solutions for Greater Minnesota's future

Center for Rural Policy & Development Board of Directors

Dan Reardon
Board Chair
Otto Bremer Foundation

Lois Mack
Vice Chair
Waterville, Minn.

Neil Eckles
Secretary/Treasurer
Blue Earth Valley Communications

Robert Bunger
HBH Associates

Rep. Tony Cornish
Minn. House of Representatives

Richard Davenport
Minnesota State University, Mankato

Garfield Eckberg
Farm Bureau

Louis Hohlfeld
McKnight Foundation

James Hoolihan
Blandin Foundation

Cynthia Johnson
Farmers' Union

Kevin Kelleher
Houston County Commissioner

Colleen Landkamer
Blue Earth County Commissioner

Sandy Layman
Iron Range Resources

Allen Olson
Eden Prairie, Minn.

Sherry Ristau
Southwest Initiative Foundation

Sen. LeRoy Stumpf
Minn. State Senate

Rural Minnesota Journal Editorial Committee

Jean Burkhardt
Northwest Area Foundation

Richard Davenport
Minnesota State University, Mankato

Louis Hohlfeld
McKnight Foundation

Sandy Layman
Iron Range Resources

Wy Spano
University of Minnesota, Duluth

Tom Stinson
University of Minnesota

© 2007 Center for Rural Policy and Development

The Center for Rural Policy and Development, based in St. Peter, Minn., is a private, not-for-profit policy research organization dedicated to benefiting Minnesota by providing its policy makers with an unbiased evaluation of issues from a rural perspective.

Any opinions voiced in the Journal are those solely of the authors and not necessarily of the Center.

Center for Rural Policy and Development
600 S. Fifth Street, Suite 211 • Saint Peter, Minnesota 56082
(507) 934-7700 • (877) RURALMN

RMJ can be found on the web at:
www.ruralmn.org

Table of Contents

Editor's note

Jack Geller

Few topics today are closer to the front burner of policy development at both the state and national levels than health care. So we are excited that we have the opportunity to infuse some rural aspects into this policy discussion as both the Minnesota Legislature and the U.S. Congress tackle this important issue.

Health care and Minnesota seem to go hand in hand. Minnesota is home to the Mayo Clinic, one of our nation's most prominent health care providers. Minnesota is also a national leader in the medical device industry. We take pride in our consistently high national rankings as one of the "healthiest" states in the nation. And by national standards, we experience a relatively low rate of uninsurance. Yet we all know that all is not well in the health care sector; and that is especially true in rural Minnesota. Accordingly, we are pleased to dedicate an issue of the ***Rural Minnesota Journal*** to bringing attention to this dimension of health care that is often overlooked.

As you will see throughout this volume, while rural Minnesota communities, residents and health care institutions experience some of the same health care issues found in the Twin Cities metro, they also experience unique problems of their own. For example, Jay Fonkert elaborates on the issues of the rural health care workforce, where aging practitioners and health profession shortages create significant access barriers for many of our rural residents. And Sarah Sprengeler, a fourth-year medical student at the University of Minnesota in Duluth, provides us with a very personal first-person account of why she has chosen to become a rural family physician.

The issue of health insurance is front and center in the policy debate as state after state line up with some new type of experiment or initiative. Two articles by Kathleen Call and Julie Sonier help us understand how this insurance issue is playing out in both the rural and metro areas of our state. As these articles document,

the percentage of Minnesotans receiving comprehensive health care coverage from their employers has actually declined in Minnesota (even in the metro). Accordingly, public programs such as MinnesotaCare are receiving much greater attention. And in communities throughout rural Minnesota, where small businesses are the only businesses, these public programs that are designed for working individuals and families who are not offered employer-based coverage take on even added importance.

While everyone is concerned about quality of care, how do we actually measure it within the rural health care context? Michelle Casey from the U of M explores this issue within the hospital experience. And Larhae Knatterud addresses one of the most important issues facing many rural communities — that of long-term care. With a disproportionately high percentage of senior citizens and longer life expectancies, rural Minnesota communities will become the testing ground for long-term care solutions that will soon affect every community in Minnesota.

And lastly, we also try to address in this volume some topics that are uniquely rural, such as the steady disappearance of small, rural, independently owned community pharmacies; the opportunities and barriers that face the delivery of telehealth services in rural places; and the challenges facing the delivery emergency medical services, where unlike in urban areas, the distances are often much greater and the workforce is overwhelmingly made up of volunteers.

So as Minnesota moves forward with its own health care proposals and initiatives, I hope policymakers keep in mind how these dynamics play out in our rural communities. And it is with that idea in mind that I hope that after you have had an opportunity to read and digest the articles and perspectives in this volume that you join us on June 18-19 at the harbor in Duluth to discuss and debate these topics at our ***Rural Minnesota Forum*** **on Rural Health Care** along with Minnesota's annual State Rural Health Conference. Information on these events can be found on page ix.

Foreword

Liz Quam

It is a great privilege to be introducing you to this edition of the Rural Minnesota Journal. Focused on a long-time love of mine, rural health, the Center for Rural Policy's Journal brings to you the knowledge of some of our wisest and most experienced rural health advocates.

Can you feel the wealth in your hands?

For those of you reading a paper copy of this Journal, the energy of the wealth contained here truly should pulse through your hands and swell your heart with pride. *(For those reading via computer screen, you could try placing your forehead on the screen and saying "uhhmmm" and see if anything happens!)*

Seriously, Rural Minnesota is wealthy because of the spirit, tenacity and values of its residents. The shortfall comes from elsewhere. There are some from the Twin Cities or Washington, D.C., who make incorrect assumptions about what "should be done" for rural Minnesota. Sadly, there are others who have never considered that roads in our state go further north and west than St. Cloud or further south than Northfield.

The Minnesota Rural Health Association (MRHA), which is made up of "thought leaders" throughout the state, is determined to serve as the catalyst that changes some current perceptions. These perceptions have become a strong undercurrent, impeding rural progress. The strongest tow in this undercurrent is that "bigger is somehow better." No place is this more evident than when focusing on health care. Yes, we want all Minnesotans to have access to top-notch services, and in some cases that means traveling to a more populated area. However, there is absolutely no way you can best the quality and healing effect of allowing a senior citizen to age in place. It is reassuring to have your first responder also be your neighbor and to ride with you in the ambulance after that suspected heart attack. Certainly, continuity of primary health care is much

more possible in small clinics in rural Minnesota than in most large clinic settings. How can we possibly measure the quality of having the family physician who delivered you telling you to knock off that unhealthy habit? And what about the quality of rural life for a family with young children and the long-term, positive effects on the health of those family members?

If you are reading RMJ, you are most likely a thought leader for our state, whether or not you recognize yourself as such. What can and should we collectively be doing to assure that our seniors are free to remain in their homes and communities? What should we be doing to assure that working families can afford to remain in rural Minnesota? In most instances this requires access to affordable health care coverage — something a majority of rural working families do not have access to through their employer.

When revamping its priorities for 2007, MRHA determined that first and foremost perceptions have to evolve to a broader recognition of the value of rural living, the quality of rural health care (appropriately measured) and a paradigm shift regarding public policy's propensity to favor bigger as being better. We are therefore calling for ideas that are creative, practical, outrageous or otherwise offered up by thought leaders on how to create this evolutionary force. MRHA's first step was to adopt the following resolution:

Whereas *there has been a demographic shift in Minnesota; and*

Whereas *this shift has resulted in declining populations in many rural communities and a decline in economic and social capital in these areas; and*

Whereas *this shift has also resulted in urban congestion and related problems;*

Be it therefore resolved *that all new state initiatives include a review to assess opportunity to locate selected state funded jobs and infrastructure, over time and when appropriate, in rural communities, thereby helping to relieve urban congestion and fostering rural vitality.*

The review is to be called a "Rural Opportunity Assessment, ROA."

Recently, MRHA's President-elect, Barbara Muesing, told the state's Rural Health Advisory Committee: "From Rock County on the Iowa border to Kittson County on the Canadian border, we find significant decline in population and with it an aging population. The trend line appears to be continuing — schools graduating 20 seniors may have 10 children entering first grade.

"At the same time, the metropolitan area population is increasing, which has its own challenges, some of which are not being met very well. Congestion on the roadways is [an expensive] example… Our resolution is as much about sustainable economic development as it is rural health. In the communities where I live and work, the two are one."

It is MRHA's view that some state-funded infrastructure and professional level employment could locate and function well in rural communities. Of course, we are not suggesting that state workers be transferred to Hallock or Hackensack against their wishes. Rather, in this cyber age, we are asking for changed thinking on job placements by both the state and private companies. Are there communities that should become knowledge clusters regarding certain industries? What creative ways could we use to develop and identify communities set up for vital aging in place? Can we change the law to allow co-op members to purchase health care as a group since many of our rural businesses no longer offer coverage?

It's group-think time. The Bible story comes to mind of the servant given the 10 talents. Let's put our collective wealth to work and make our whole state, and most especially our rural areas, even richer.

I look forward to hearing your ideas and working with you to make expansion of rural wealth, spirit, tenacity and values an evolving and expanding reality.

Acknowledgements

The Center for Rural Policy & Development gratefully acknowledges our friends who have made RMJ possible.

BREMER
BANKING • INVESTMENTS • TRUST • INSURANCE

BLANDIN FOUNDATION

THE McKNIGHT FOUNDATION

Bush Foundation

office of Rural Health & Primary Care
MINNESOTA DEPARTMENT OF HEALTH

Immanuel St. Joseph's
Mayo Health System

Northland Foundation

WEST CENTRAL INITIATIVE

SOUTHWEST INITIATIVE FOUNDATION

SOUTHERN MINNESOTA Initiative Foundation

Rural Minnesota Forum

Examining Rural Health Care

June 18-19, 2007, Duluth

Save the date!
2007 Rural Minnesota Health Conference

This year's Rural Minnesota Forum will be held jointly with the Minnesota Department of Health, Office of Rural Health and Primary Care's Minnesota Rural Health Conference, "Growing Healthy Rural Communities," June 18-19 in Duluth.

The Rural Minnesota Forum will take place June 18 and will bring together many of the Journal's authors and other experts in the health care field to discuss the policy issues that are most important to rural residents today.

That same day the Office of Rural Health will host an invitation-only Critical Access Hospital conference for hospital administrators and other representatives from the state's critical access hospitals.

Tuesday's "Growing Healthy Rural Communities" conference will use keynote speakers and breakout sessions to take an in-depth look at how rural communities are maintaining and improving the quality and availability of health care services.

This two-day event is designed for policy makers, professionals and anyone else interested in and concerned about health care in rural Minnesota.

For more information on this joint event, visit the Center for Rural Policy's web site at **www. ruralmn.org** or the Department of Health's site at **www.health.state.mn.us/div/cfh/orhpc/conf/07.htm.**

Join us June 18-19 for a statewide conversation on rural health.

Simple, Elegant, and Flexible: Why I Chose to be a Rural Family Doctor

Sarah Sprengeler

Three short years from now, I will be nearing the end of a long journey through some twenty-five years of education as I complete a residency in Family Medicine. People will call me "doctor." I will serve an endearing group of people that I refer to as "my patients." They will call me in the middle of the night when their newborn won't stop crying, when their elderly mom has fallen out of bed, or when their contractions are "almost ten minutes apart." I will offer advice over the phone for free, because it's what a doctor is called to do. I'll see them through hospital stays, deliver their babies, and, when the time comes, I'll offer support and care for the dying.

Understanding the history

In this day and age, the term "physician" encompasses a huge breadth of trained medical professionals. Family Medicine became the 20th official specialty in American medicine in 1969. However, its history goes back thousands of years. The first physicians in the world were generalists who provided all of the medical care available. They diagnosed and treated illnesses, performed surgery and delivered babies. After World War II, the age of specialization began to flourish and physicians chose to limit their practices to specific, defined areas of medicine. Since then, the number of specialists and sub-specialists increased at a phenomenal rate, while the number of generalists declined dramatically. The public became increasingly vocal about the fragmentation of their care and the shortage of personal physicians who could provide initial, continuing and comprehensive care. Thus began the reorientation of medicine back to personal, primary care, and the concept of the generalist was reborn with the establishment of Family Medicine as its own field almost forty years ago. (AAFP, 2006.)

In a world where medicine is growing ever more complex, where patients are sorted based on individual disease states and organ systems, Family Medicine is unique. Family physicians diagnose and treat a huge variety of illnesses in their patients. Their approach to medicine is simple, elegant and flexible. Patients are treated by a personal physician who knows their living situation and family. In Family Medicine, the relationship between the physician and patient is at the center of the healthcare system.

Making the choice

Choosing to become a family physician was not a terribly difficult task for me. I knew that I wanted to be able to live in a rural Minnesota community and be "their doctor." Other specialties in medicine just couldn't fit that mold. I love to deliver babies, but OB-GYN doctors don't see the kids they deliver until that child grows up and is pregnant with kids of her own. I enjoy pediatrics, but I also like to have adult conversation with patients. I loved emergency medicine. The thrill of knowing you might save somebody's life "right there" is seductive, but it drove me nuts when I never found out what happened to my patient after they left the Eemergency room. Cardiologists couldn't help you if you had a broken bone or an ear infection; orthopedists couldn't help you with your skin lesions, your headaches or your chest pain. Every specialty I learned about in medical school was interesting, but I always found myself wondering about my patient far beyond the realm of the specialty in which I was studying. In short, I felt like I was short changing patients because I knowingly left most of their issues untreated.

A profession of caring

I am studying to be a family physician because I want to be useful to people. I am a teacher at heart but I just couldn't see myself in a classroom. Instead, my loves for medicine, learning, and teaching directed my medical career into the epicenter of primary care: rural family medicine. In my opinion, Minnesota's rural family doctors are science teachers who take individual appointments. They are also skilled workers, performing surgery, office procedures, and emergency care depending on the needs of their community. Just as a teacher finds gratification in filling young minds with wisdom, the family physician can save a life by educating that teacher about the need to take her blood pressure medication to prevent a stroke. The family doctor is there to take care of a whole community. The part of their job that keeps them coming back to work in the morning is

the gratification that they are able to truly help people during their greatest times of need.

The lure of Lake Wobegon

After I finish my official training in Family Medicine, my husband and I will move to a small town in Minnesota to practice medicine. I think the attributes of rural living ensure my ability to treat patients successfully. Small towns are more intimately connected than big cities. Neighbors know each other. Life is less likely to be complicated by a preoccupation with material goods because there aren't numerous shopping malls nearby. Schools are the pride of a community, family-run businesses are still around, and churches stand proudly at the center of town. Although a city man himself, Garrison Keillor knows how to describe rural Minnesota when he repeats the ever-familiar phrase at the end of his radio program: "Where the women are strong, the men are good-looking, and all the children are above-average." Rural communities are among Minnesota's richest treasures.

I grew up a happily curious kid. Being raised by physician-parents, I was exposed to medical books from the get-go, like *Netter's Atlas of Human Anatomy,* which directed my desire to learn about the human body. I made it a point to discover for myself how things work. In elementary school, my curiosity prompted me to embark on self-directed research endeavors, such as feeding hormone pills to my mom's African violets or tracking people's blood pressure readings as they listened to a tape of kids making a mess of the house. I also loved to "help" anybody in medical distress. Instead of playing "house" with my Barbies, I played "doctor." One morning, I discovered that Hollywood Hair Barbie had fallen into the paws of my destructive puppy dog, who inflicted some near-fatal injuries on my innocent doll. To Barbie's benefit, I happily spent the day repairing her lacerations with medical tape and Silly Putty skin grafts.

Genetic predisposition

When I was little, I remember being up late at the hospital nurses' station while Mom delivered babies. I knew about forceps, labor, and pitocin, and I think I've always been familiar with the consequences of "the birds and the bees." Over the years, I have come to realize how much I learned about medicine from being raised in my family. Making the decision to spend the rest of my life as a physician was not difficult. I haven't ever wavered from that goal. My genuine desire to take care of people has been with me since I was very small. I was raised in a household that taught me

to hold the service of others in high regard. In my mind, there is no greater satisfaction than knowing that you've helped someone feel better.

My journey into rural medicine didn't begin in the town of Population-Less-Than-Five-Thousand, Minnesota, where the majority of my classmates at the University of Minnesota Medical School -- Duluth Campus grew up. I grew up in St. Cloud, which has, in the past ten years, become the latest sprawling, traffic-laden suburb of "The Cities." However, that phenomenon did not prevent my growing up under the care of a group of excellent family physicians who took care of our whole family. They did our sports physicals, delivered my siblings, and took care of me in the hospital when I had pneumonia as a 6-year-old. They really cared about us and it showed. We didn't really need to see anybody else unless it was for something weird, like when my mom came down with Guillain Barre syndrome. Our family doctor sent her to a neurologist for care, and when she recovered, it was back to the family doctor again. In my mind, this was the way medicine was supposed to be.

Testing the waters

During the summers between years of college, I found myself working at a Lutheran Bible camp in northwestern Minnesota. This was where I first encountered a rural family physician. One of my diabetic campers had forgotten to take her insulin and became very ill. It was a Sunday evening and the clinic in town was closed, of course. I thought we would need an ambulance to come from the nearest hospital, 30 miles away. Instead, the camp director took out the phone book and called the family doctor who lived just a mile down the road. He came at once and saw my camper, gave her a shot of insulin, and accompanied us to the local hospital. Once there, he wrote orders for her admission and saw her through her illness. I was impressed at how knowledgeable he was, but more importantly, I saw how he gave up his Sunday night when he wasn't on call because somebody really needed him.

The very next week, I had a camper who somehow lodged a fishing lure through his eyebrow. I took him to the hospital (I knew where it was after the incident with my previous camper), and a very familiar face was there in the emergency room. It was the same physician who had taken care of my diabetic camper the week prior! He skillfully removed the lure and stitched my camper's eyebrow back together. When he was done stitching, he excused himself rather quickly. I asked the nurse what the rush was for. "He's delivering a baby in the next room," was her reply. I was enamored

with his line of work. This man was needed by so many people, and he handled his responsibilities with humility, skill and grace.

High-contrast experiences

I began to learn about what made family medicine different from other specialties after college when I got a job as a medical assistant in a busy metro area ear, nose, and throat (ENT) clinic. The physicians I worked with were nice people, but they ran on a completely different wavelength from the family physicians I had grown up with. They saw 40 patients a day -- sometimes more than that. Appointments were very brief. Services were performed, ears canals were cleaned, sinuses were irrigated, and vocal cords were visualized using the long spaghetti-like flexible endoscopes. Patients came and went like snowflakes on a June afternoon. It took five medical assistants to keep all the patients moving.

Patients didn't depend on the ENT physicians for comprehensive medical care. Our clinic sorted patients based on the pathology of an organ system. The competent physicians knew everything there was to know about ear canals and sinus cavities; they even performed complicated head and neck surgical cases. I would bring my daughter to see one of them in a second if she needed tubes placed in her ears. However, they were not like family physicians. If they had been family physicians, our patients would have had an entirely different relationship with us. Patients would have had a personal physician who knew them, answered their questions, and addressed all of their medical needs.

Launching an education

In the fall of 2003, after one year with the ENT physicians, I started medical school at the University of Minnesota Medicine School – Duluth Campus. Compared to the large Twin Cities campus, the smaller, more family-oriented Duluth campus prides itself on how many family physicians it generates for rural Minnesota. Together with fifty classmates, I navigated the rigorous academic curriculum of the first two years. Medical school surprised me. As difficult as it was, it was also more fun than I have ever had in an academic setting. The people I met made all the difference. My classmates and professors were the most wonderful people I think I will ever know.

Many of my professors have been teaching medical students in Duluth since my parents went to medical school there thirty years ago. Clearly these professionals have dedicated their lives to

providing Minnesota with good quality family physicians. Instead of merely tolerating students who might take away from their time in a research lab, our professors actually liked to teach. Our histology professor would be covered in chalk dust at the end of an hour's lecture because he illustrated the intricacies of cell adhesion molecules with a dozen different colors of chalk. Our pathology professor likened the intrinsic and extrinsic coagulation cascades to pairs of stiletto heels. Oftentimes, on the day before the "killer" exams, our professors would subject themselves to interrogation in front of our class until all questions were answered. I think we drilled one poor professor for four hours before we released him. He will be back next year to be interrogated by the next class.

Our lectures were all in the same classroom; the professors came downstairs from their labs to lecture. It was like a one-room schoolhouse. This added to the already-strong camaraderie I had with my classmates. Some days we would get to school before the sun came up and went home after dark. If a classmate was absent, everybody knew, and if you were gone two days, you could expect your classmates to come to your door and find you. When somebody got engaged, the whole class celebrated. When somebody's grandparent died, the class sent flowers, and twelve people would offer you their notes from lecture. The whole environment of Duluth's medical school exemplifies family practice. It is a fantastic model for learning how medicine can be practiced both personally and efficiently.

Experiential learning

We spent time with community family physicians from the third week of class. The first year we followed local physicians in the hospital and clinic, the second year we were sent out to small towns all over Minnesota to spend a few days with a family physician and his or her family. I spent some time in Moose Lake, Minn., a little town on Interstate 35 between Duluth and the Cities. I enjoyed my experience so much that I asked to spend some time there during the summer.

One of my professors set up a summer internship for me in Moose Lake, where I spent time with clinicians, pharmacists, law enforcement officers, nurses, and a dentist. Overall, the experience was fascinating. The hospital happily provided lodging for me in a little house across the parking lot so I could see late-night deliveries and E.R. patients. During my short three-week stay, I saw family doctors delivering babies and performing C-sections, colonoscopies, endoscopies, tubal ligations, circumcisions, and vasectomies. In

the E.R., I learned valuable skills such as how to question people presenting with chest pain, how to suture, and what to look for in a domestic abuse situation. The pharmacists taught me how to calculate creatinine clearance for the ICU patients. The social workers in the nursing home allowed me to sit in on a family meeting for a new resident admission. I watched a family dentist use hundreds of tools to construct a new incisor for a 16-year-old. I followed the nurse anesthetist who walked me through how to give miraculous pain relief to a woman in labor. In the clinic, my preceptor showed me how to find fetal heart tones. I watched as he carefully removed skin cancers. I found that I was already able to apply the history and physical skills that I'd just learned in my first year of medical school.

The physicians I met in Moose Lake reminded me of the family doctors I had known and loved growing up. They were the type of physicians who would have taken care of my diabetic camper on a Sunday night. My clinical skills were miles ahead of where I thought I'd be by the end of my second year because these doctors had been so generous with their time. I wanted to spend as much time as I could learning from them.

Immersion learning

Traditionally, medical students who finish two years in Duluth transfer to the Twin Cities campus for the latter half of medical school, the clinical years. Instead of going directly to the big-city hospitals, medical students at both campuses, thankfully, have the option of spending nine months in a small town learning medicine from small-town doctors. This unique program is affectionately referred to as "R-PAP," which stands for "Rural Physician Associate Program." I was sent back to Moose Lake.

The physician who took me under his wing in Moose Lake treated me as an equal. At first, the learning curve was steep. He sent me in to see his patients right away and then asked me for my treatment recommendations. Being fresh out of the books and rather raw in practical patient care knowledge, I quickly learned how junior I was. After just a few weeks, however, I felt much more confident. He always saw my patients after I did, asked me what I thought, and explained the intricacies of each disease state. I read textbooks in a different way than I had ever read them before. When I had a patient in heart failure, I saw her swollen ankles and I read to understand it. If my patient was wondering if her unborn child could hear, I dug out my embryology textbook and read until I knew the answer. My preceptor physician sent me over to the hospital to admit new patients from the clinic. I ordered labs, looked at CT scans, and

dictated. We worked in the emergency room, where I learned how to intubate and treat trauma patients. I admitted patients to rule out heart attacks and strokes, learned how to treat electrolyte disorders, and delivered almost fifty babies. By the end of the experience I had seen more than a thousand patients.

Big city, big difference

The last year of medical school involved moving away from Duluth and taking some rotations at bigger medical centers in the Twin Cities. I did a few of these at Hennepin County Medical Center, a gigantic health care facility in downtown Minneapolis. The ICU at HCMC held more patients than the entire hospital in Moose Lake. At first, I felt like a fish out of water. There were seven buildings with seven floors each. Once I was able to find my patient, however, I found that the medicine was much the same as it had been in Moose Lake. The diseases were the same: people still had depression and heart disease and kidney failure. The drugs and therapies were the same. The biggest difference was in how many specialists were around. No matter what disease your patient had, there was a physician who specialized in the treatment of it, and he or she would come and consult on your patient.

My time at Hennepin sealed my decision to become a rural family doctor. The medicine floor was a sea of consulting sub-specialists. My job was to navigate the waters for my patient. I had to pick and choose among all the specialists and their procedures to treat my patient appropriately. It was difficult and frustrating because my patients never had just one disease. They were complicated individuals with compounding chronic and acute medical and psychosocial pathologies. No single specialist could treat my patient as well as I could because I was treating a whole person instead of an organ system or a disease. Another interesting phenomenon: many of the specialty procedures provided to my patient were simple, logical treatments that I could have done myself. I started to understand why primary care makes sense as a cost-saving and personal way to deliver excellent health care. Within the walls of a county hospital, I learned how our sophisticated medical system can over-treat a patient without listening to their story. I missed the elegant simplicity of rural family medicine, where my patients wouldn't fall through the cracks and get lost in the shuffle.

I am privileged to have the opportunity in life to pursue my dream career. Becoming a physician takes a huge investment of time and money, more than I originally anticipated. Today, if I had

the choice, I would do it all over again, and I don't think I would change much. It is hard for me to believe that I have only a few years remaining before I can find that rural community that needs a physician. As the future of medicine is sure to change, I can't be sure how my future practice will turn out. However, I am sure of one thing. No matter what, once the exam room door closes and it is just me and my patient, I will still be able to talk to and take care of people, and I will be their doctor.

Reference

American Academy of Family Physicians: Family Medicine: Scope, Philosophical Statement. Website. 2006.
URL: http://www.aafp.org/online/en/home/policy/policies/f/familymedicine.html

Health Insurance Coverage and Access to Care Among Rural and Urban Minnesotans

Kathleen Thiede Call & Jeanette Ziegenfuss

Introduction and background

Having health insurance is among the greatest predictors of access to health care services in the United States. Although the relationship between health insurance and access to medical care is not perfect, there is ample evidence that those without insurance experience restricted access to care (Brown, Bindman, and Lurie, 1998; Committee on the Consequences of Uninsurance 2002; Olson, Tang, and Newacheck 2005), and when they do finally seek services, they are in worse health than those with health insurance (Berk and Schur 1998; Stoddard, St.Peter, and Newacheck, 1994). This is of grave concern given that the rate of uninsurance in the U.S. has been on the increase for some time (DeNavas-Walt and Proctor, 2006), and that after years of stable and low rates of uninsurance, in 2004 Minnesota experienced a significant increase in the rate of uninsurance as well. Between 2001 and 2004 the rate of uninsurance in Minnesota increased from 5.7% to 7.4% (Minnesota Department of Health and University of Minnesota, 2006).

Residents of rural counties experience more restricted access to health insurance than those living in urban settings (Coburn, McBride, and Ziller 2002; Eberhardt and Pamuk 2004; Hartley, Quam, and Lurie 1994; Hueston 2000; Kaiser Commission on Medicaid and the Uninsured 2003). Hu and colleagues (2006) demonstrated that rates of uninsurance among working-age adults were significantly higher in rural than urban counties even after controlling for known correlates of health insurance coverage.

This research was funded by the Blue Cross Blue Shield of Minnesota Foundation, a grant awarded to the Health Economics Program at the Minnesota Department of Health by the federal Health Resources and Services Administration, and the Minnesota Department of Human Services.

These disparities in coverage are associated with differences in employment patterns and structures, with more rural residents being self-employed or employed by small firms that are less likely to provide insurance to employees (Frenzen 1993; Larson and Hill 2005).

Some research indicates that restricted access to employer-sponsored coverage leads more rural than urban residents to purchase their own insurance (Frenzen 1993) or to enroll in Medicaid (Hurley, Crawford, and Praeger 2002; Long, King, and Coughlin 2006). Other research indicates that regional differences in income are associated with rural residents being less able to purchase insurance in the private market, while at the same time poor rural residents are somewhat less likely to be eligible for and covered by public insurance than poor urban residents (Eberhardt and Pamuk 2004; Frenzen 1993). Income differences also impact the likelihood of accepting employer sponsored coverage. A recent study by Larson and Hill (2005) shows that in general, rural and urban workers are equally likely to take up an employer's offer of coverage, with the exception of low-wage workers in rural settings: they are more likely to decline the offer than their low-wage urban counterparts. A recent Kaiser Commission report (Kaiser Commission on Medicaid and the Uninsured, 2003) on health insurance coverage in rural counties showed greater coverage disadvantages among those living in more remote rural counties than rural counties adjacent to urban counties.

The implications of these coverage differences for access to services may vary by place of residence. Generally speaking, the uninsured are less likely to report a usual source of care — a common measure of access to medical care (Brown, Bindman and Lurie, 1998; Committee on the Consequences of Uninsurance 2002; Olson, Tang, and Newacheck 2005). Interestingly, several studies (Hartley, Quam, and Lurie, 1994; Larson and Hill, 2005; Reschovsky and Staiti 2005) show that the uninsured in rural counties are more likely to have a usual source of care than urban uninsured, perhaps speaking to the strength of the safety net and community (and physician) support for the less fortunate in some rural counties. By contrast, when looking at reported *confidence* in one's ability to get needed care, a measure of perceived access to care, individuals in rural adjacent counties (counties adjacent to urban counties) and rural non-adjacent counties are less likely to report this confidence than are their urban counterparts (Ormond, Zuckerman, and Lhila 2000).

Here we focus on health insurance as the key determinant of access to services, but we acknowledge that rural residents confront

additional access barriers such as transportation difficulties and a more restricted supply of medical services than residents of urban settings (Eberhardt, Ingram, and Makuc 2001; Edelman and Menz 1996).

We use data from the 2001 and 2004 Minnesota Health Care Access (MNHA) surveys to examine differences in health insurance coverage and access to coverage among non-elderly[1] Minnesotans living in three geographic regions: rural counties, rural counties adjacent to urban counties, and urban counties (see Appendix A for county breakdown). Specifically, we set out to answer five interrelated questions:

1. Are there differences in the distribution of health insurance coverage among residents of rural, rural adjacent and urban counties, and has the coverage distribution changed over time?
2. Are there geographic differences in the extent to which workers are able to gain access to insurance through their employers?
3. What demographic, health status and employment characteristics are associated with differences in health insurance coverage by residency?
4. Among those lacking insurance, does potential access to coverage through employers or public insurance programs vary by residency? And,
5. What is the relationship between health insurance coverage, having a usual source of care, and confidence in getting needed care among rural, rural adjacent and urban residents?

Data and Methods

Study Design and Sample

Data are from two statewide surveys of health insurance coverage, the 2001 and 2004 MNHA surveys. Both surveys were administered by telephone using a stratified sampling design that over-sampled in low-income, minority and rural counties of the state. Although only about 1% of Minnesota households do not own telephones (U.S. Census Bureau 2004) statistical adjustments were made to account for non-telephone households (Keeter 1995). Data were weighted to be representative of Minnesota's population.

In 2001, a total of 27,315 surveys were completed, yielding a response rate of 65%, and in 2004 a total of 13,802 interviews were completed for an overall response rate of 59%.[2]

Measures

For the primary variable of interest, insurance status and type, all respondents completed questions about current health insurance status and coverage over the past year.[3] The responses to these questions are used to classify respondents as uninsured, covered by public insurance, employer-sponsored insurance or private self-purchased insurance at the time of the survey.

County name and zip code information were collected in the interview, which were in turn used to classify respondent's county of residence as rural or urban. This is done using Urban Influence Codes developed by the U.S. Department of Agriculture, Economic Research Service.[4] In this paper, comparisons are made between urban, rural adjacent and rural non-adjacent groups of counties regardless of the size of the urban area and/or if the rural county is a micropolitan area or non-core area, assuming adjacency to an urban area may impact access to larger employers and therefore access to employer subsidized insurance or higher wages (see Appendix A for the geographic designation by county).

The survey includes questions about key demographic variables (i.e., age, race/ethnicity, marital status, income, and education), self-reported health status, and employment information (see Appendix B for operational definitions of all variables). The survey also includes measures of whether individuals have an offer of insurance from their own or a family members' employer, whether they are eligible for this offer, and if eligible, whether they took up this offer of coverage. We use this information to determine if the uninsured are eligible for employer sponsored insurance. Income, family size, and age are used to estimate if an uninsured individual is potentially eligible for public insurance. Finally, we examine the relationship between health insurance coverage and access to health care using two common indicators of access: reports of a usual source of care and whether an individual is confident in their ability to obtain needed health care.

Analysis

Using weighted data to match actual population breakdowns, we will:

- Analyze rates of insurance coverage by the three geographic regions (i.e., urban, rural adjacent & rural non-adjacent).
- Examine access to employer-sponsored health

insurance (i.e., employer offers of insurance, employees' eligibility for insurance and percent who take eligible coverage) by geographic region.

- Present weighted population characteristics such as demographic, socio-economic and work-related variables associated with coverage across the geographic regions.
- Examine the estimated eligibility rates for potential sources of health insurance coverage (both public and private) across the three regions.
- Across the three geographic regions analyze respondents' reported access to a usual source of care, as well as their reported confidence in getting needed care.
- Finally, present three multivariate logistic regression analyses that calculate the odds of lacking insurance coverage, having no usual source of care and no confidence in ability to access needed care across all of the geographic, demographic, and socio-economic variables.

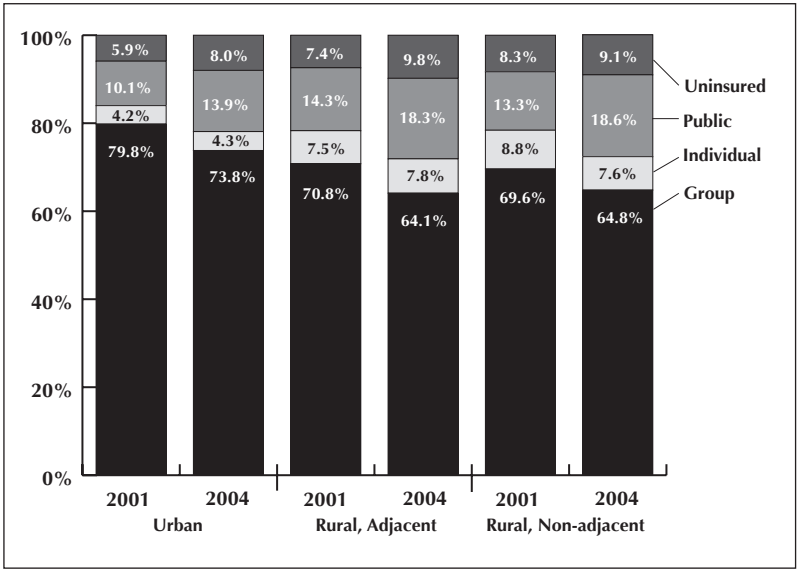
Results

The next five subsections answer each of the research questions concerning the patterns of coverage, access to coverage and access to care across rural and urban counties that were introduced at the beginning of the article.

Distribution of health insurance coverage

The majority of Minnesota's population lives in urban counties as they are defined for this study. Approximately 74% of the non-elderly population, or approximately 3.3 million, live in an urban county. This compares to 14% (610,000) living in adjacent rural counties and 12% (560,000) in non-adjacent rural counties. The distribution of the uninsured within the state follows a similar pattern. While the majority (68% in 2001 and 70.4% in 2004) of individuals without health insurance live in urban counties (data not shown), the distribution of uninsurance within the three geographic areas does not differ significantly. In 2004, 8% of individuals in urban counties were uninsured, compared to the approximately 10% in rural adjacent counties and 9% in rural non-adjacent counties

Figure 1: *Health insurance coverage by geographic region in Minnesota, 2001 and 2004.*



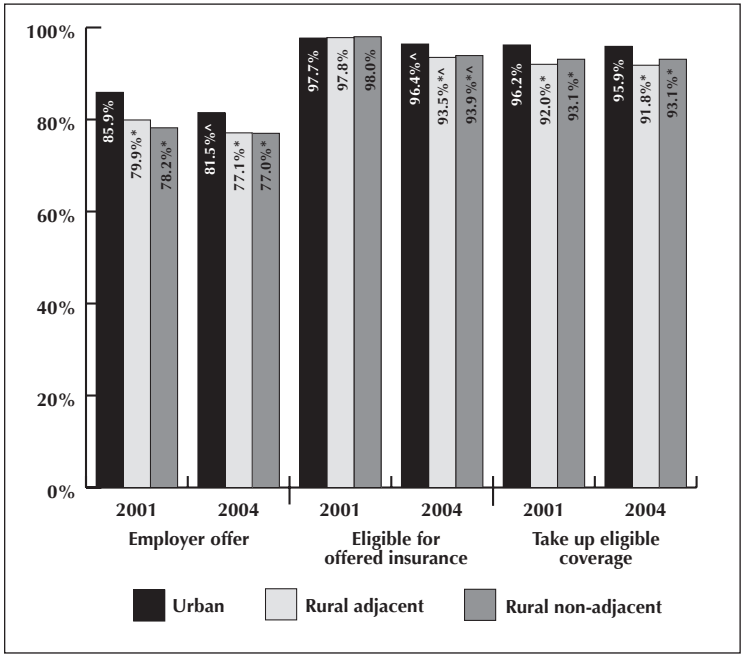
Source: 2001 and 2004 Minnesota Health Access Survey
** Indicates statistically significant difference between urban and rural (adjacent and non-adjacent) counties at p<0.05*
^ Indicates statistically significant difference between years at p<0.05

(see Figure 1). It is important to note that those living in rural areas (unless otherwise specified, "rural" includes both adjacent and non-adjacent counties) are no more likely to be uninsured than are those in urban areas even when we control for known correlates of coverage that do differ by geography, such as income, education, and employment (see Tables 1 and 2 for list of variables; see Appendix D for results of the multivariate analysis).

Although the rates of uninsurance are similar across regions of Minnesota, there are important differences with respect to the type of health insurance coverage across regions. Individuals in rural counties are more likely than urban residents to be insured by public programs or have individual insurance. These other types of coverage make up for the relatively low rates of employer-sponsored insurance in rural counties compared to urban counties (approximately 64% coverage in rural adjacent, 65% in rural non-adjacent, and 74% in urban counties) and thus result in the observed equality of uninsurance rates.

Between 2001 and 2004, there was a 35% increase in uninsurance in urban Minnesota (from 6% to 8%) but no parallel increase in rural

Figure 2: *Employer-sponsored health insurance: offer, eligibility, and take up by geographic region in Minnesota, 2001 and 2004.*



Source: 2001 and 2004 Minnesota Health Access Survey
** Indicates statistically significant difference between urban and rural (adjacent and non-adjacent) counties at p<0.05*
^ Indicates statistically significant difference between years at p<0.05

counties, resulting in uninsurance rates that are now similar across regions. Over this same time period, all three regions experienced a decrease in employer-sponsored insurance (ranging from a 7% decrease in rural non-adjacent counties to a 10% decrease in rural adjacent counties) and an increase in public insurance coverage (ranging from a 40% increase in rural non-adjacent counties to a 28% increase in rural adjacent counties).

Employer sponsored insurance: Offer, Eligibility, and Take-up

Looking at Figure 2, we see an important difference with respect to access to employer-sponsored insurance within the state of Minnesota. More Minnesotans in urban counties are offered insurance through their own or a family member's employer than are Minnesotans in rural counties. This remained true in both 2001 and 2004, despite a significant drop in the portion of urban Minnesotans who had an employer offer of health insurance. Further,

Table 1: *Demographic characteristics of the uninsured and total population by geographic region in Minnesota, 2004.*

	Urban		Rural, Adjacent		Rural, Non-Adjacent	
	Uninsured n=694	**All in Urban n=7,648**	**Uninsured n=161**	**All in Adjacent n=1,487**	**Uninsured n=193**	**All in Non-Adjacent n=1,916**
Gender						
Male	58.2%^	48.6%	44.8%*	48.3%	55.5%	50.3%
Female	41.8%^	51.4%	55.2%*	51.7%	44.5%	49.7%
Age						
0 to 5	6.5%	8.9%	9.4%	7.2%	8.1%	10.3%
6 to 17	10.4%^	19.0%	12.0%^	21.5%	12.6%	19.1%
18 to 34	50.5%^	28.1%	47.4%^	22.6%*	46.1%^	22.9%*
35 to 64	32.6%^	44.0%	31.3%^	48.8%*	33.2%^	47.6%
Race/Ethnicity						
White	64.5%^	85.2%	86.7%*^	95.1%*	78.9%*^	93.2%*
Black	10.8%^	6.4%	~	0.5%*	~	0.3%*
American Indian	5.1%^	1.8%	5.5%	3.1%*	8.1%^	3.3%*
Asian	6.2%	5.0%	~	0.7%*	&	1.5%*
Hispanic	17.5%^	4.0%	8.3%*	2.4%*	10.9%	2.9%
Born in the United States (for individuals 3 and older)						
No	21.5%^	9.0%	6.0%*	2.6%*	13.9%	3.9%*
Yes	78.5%^	91.0%	94.0%*	97.4%*	86.1%	96.1%*

Continued next page

Marital Status (for individuals 18 and older)						
Not Married	59.4%^	33.6%	52.9%^	27.3%*	56.3%^	27.7%*
Married	40.7%^	66.4%	47.1%^	72.7%*	43.8%^	72.4%*
Income (percent of Federal Poverty Level						
0 to 100	27.3%^	8.9%	23.2%^	9.6%	23.0%^	10.3%
101 to 200	29.6%^	12.8%	31.7%^	20.6%*	41.8%*^	19.3%*
201 to 300	20.3%	16.1%	23.6%	21.2%*	18.7%	19.6%*
301 to 400	12.6%^	18.1%	9.8%^	20.1%	11.1%^	24.0%*
> 400	10.2%^	44.1%	11.7%^	28.6%*	5.4%^	26.9%*
Education (parental educational attainment is used for children under 18)						
Less than High School	21.9%^	5.6%	8.6%*	4.7%	16.0%^	5.6%
High School	34.8%^	20.9%	47.0%^	29.7%*	29.6%	26.6%*
Some College	29.9%	33.0%	35.6%	42.3%*	40.6%	40.4%*
College Graduate or More	13.4%^	40.4%	8.8%^	23.3%*	13.9%^	27.5%*
Health Status						
Excellent/Very Good/Good	13.9%	7.4%	15.6%	8.9%	15.2%	7.9%
Fair/Poor	86.1%	92.6%	84.4%	91.1%	84.9%	92.1%

Source: 2004 Minnesota Health Access Survey

~ indicates no cases, & indicates <5 cases

** Indicates statistically significant difference between urban and rural (adjacent and non-adjacent) counties at p<0.05*

^ Indicates statistically significant difference between uninsured and total population within geographic area at p<0.05

in 2004, of those who are offered insurance through an employer, more Minnesotans in urban counties are eligible for that insurance than are Minnesotans in rural counties. This is a significant change from 2001, when there was no difference across regions with respect to eligibility among those offered health insurance. Over this time period, all regions of Minnesota had a significant drop in the portion of those with offers who were eligible for that coverage in 2004. And finally, of those eligible in each time period, more Minnesotans in urban counties take up employer-sponsored insurance than do Minnesotans in rural counties of the state. In summary, Figure 2 tells us that in rural counties, a smaller portion of the population can rely on employer-sponsored health insurance. Fewer have offers of insurance, are eligible for that coverage, and have the resources or desire to take up the coverage if they are eligible.

Characteristics associated with health insurance coverage

Table 1 (previous pages) presents demographic characteristics of the uninsured population and total population in each geographic area in 2004. As the characteristics of the uninsured did not change drastically in any of the regions between 2001 and 2004, from this point forward our analysis will be restricted to MNHA 2004 data. First looking at the overall population in each geographic area, we see that individuals in urban counties differ significantly from those in rural counties. These populations differ with respect to age (urban counties have more 18 to 34 year olds and fewer 35 to 64 year olds), race and ethnicity (urban counties have a smaller proportion of white individuals and larger proportions of all other measured race and ethnic subpopulations), nativity (rural residents are more likely to be U.S. born), marital status (the urban counties have a smaller proportion of married individuals), income (urban counties have a larger proportion of the population with higher household incomes), and educational attainment (urban counties have a larger proportion of the population with higher educational attainment).

Interestingly, however, when we compare the uninsured populations across geographic regions, many of the differences are no longer significant, meaning that the uninsured look more similar from one region to another than the whole population. There are no significant differences between the uninsured across regions with respect to age and marital status. Further, no significant differences between the uninsured in urban and rural adjacent counties are seen for income and for educational attainment, with the exception that there are fewer in rural adjacent counties with less than a high school education. No significant differences between the uninsured in urban

***Table 2**: Employment characteristics of the uninsured and total population by geographic region in Minnesota, 2004.*

	Urban		Rural, Adjacent		Rural, Non-Adjacent	
	Uninsured n=694	**All in Urban n=7,648**	**Uninsured n=161**	**All in Adjacent n=1,487**	**Uninsured n=193**	**All in Non-Adjacent n=1,916**
Employment Status						
Employed	68.0%^	80.1%	75.9%	81.0%	73.8%	81.0%
Not Employed	32.0%^	19.9%	24.1%	19.0%	26.2%	19.0%
Of those who are employed	n=476	n=6,037	n=116	n=1,161	n=137	n=1,496
Employment Type						
Self-employed	17.1%^	9.2%	14.5%	14.4%*	15.5%	17.4%*
Employed by Someone Else	82.9%^	90.8%	85.5%	85.6%*	84.5%	82.6%*
Number of Jobs						
One Job	88.0%	89.7%	86.2%	85.8%*	88.5%	84.4%*
Multiple Jobs	12.0%	10.3%	13.8%	14.2%*	11.5%	15.6%*
Hours Worked Per Week						
Part time: <35 hours/week	27.6%^	14.9%	25.4%	15.4%	32.5%^	14.4%
Full time: 35 or more hours/ week	72.4%^	85.1%	74.7%	84.6%	67.5%^	85.6%
Type of Job						
Seasonal/Temporary	23.2%^	7.2%	16.3%	11.1%*	27.6%^	8.9%
Permanent	76.8%^	92.8%	83.7%	88.9%*	72.5%^	91.1%
Employer Size						
10 or Fewer Employees	37.2%^	15.6%	34.2%	23.8%*	33.0%	25.8%*
11 to 50 Employees	19.1%^	13.3%	21.2%	13.7%	19.4%	13.9%
More than 50 Employees	43.7%^	71.1%	44.7%^	62.5%*	47.6%	60.4%*

Source: 2004 Minnesota Health Access Survey
** Indicates statistically significant difference between urban and rural (adjacent and non-adjacent) counties at p<0.05*
^ Indicates statistically significant difference between uninsured and total population within geographic area at p<0.05

and rural non-adjacent counties are seen for educational attainment and the only difference between family incomes is that there are more uninsured in rural non-adjacent counties with incomes from 101% to 200% of the federal poverty level (FPL).

Table 1 also allows us to compare the uninsured to the total population within geographic region. There are many differences between these two groups in urban counties. For example, the uninsured are less likely to be female, 6 to 17, white, married, with incomes between 101% and 200% or above 300% FPL, and have a high school education. At the same time, they are more likely to be male, 18 to 34, 35 to 64, Black, American Indian, Hispanic, not married, below 100% FPL, and at the extremes of educational attainment (less than high school or college graduate or more). With the exception of lack of differences between the uninsured and

the total population with respect to gender, the uninsured in rural counties exhibit similar differences from the total population in these counties.

Table 2 contains the employment rate and employment characteristics of the uninsured and the total population across geographic types. There are no differences between the uninsured in rural counties and urban counties with respect to employment characteristics. It is important to note, however, that despite not being significant, the uninsured are more likely to be employed in rural counties than they are in urban counties.

With respect to employment characteristics, there are many differences between the uninsured and the total population within each region. For example, within urban counties the uninsured are more likely not to be employed, to be self-employed, to work part-time, to be a seasonal or temporary worker, and to work for a small or mid-sized employer. Unlike demographic characteristics, we do not see many differences between the uninsured and total populations in the rural counties. In rural adjacent counties, the only significant difference is that fewer of the uninsured work for large employers than do the total population of these counties. In rural non-adjacent counties, the uninsured are more likely part-time workers and seasonal or temporary workers.

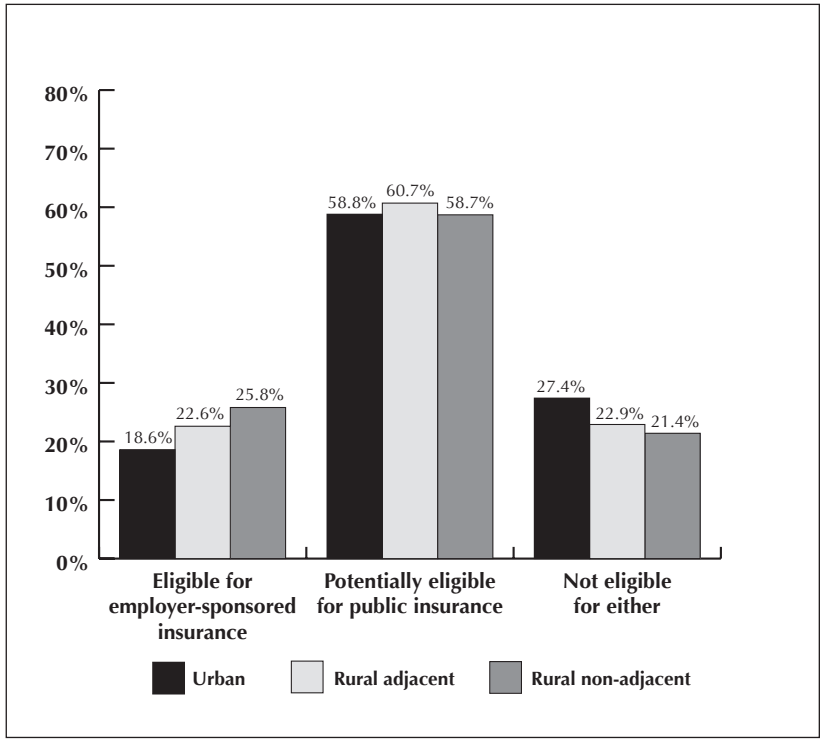
It is apparent, then, that by examining demographic and employment characteristics of the uninsured and the population as a whole in the three different regions, there are many distinct differences among the regions and within each region. However, when we control for all these factors (age, income, educational attainment, race, etc.,) we find that a person is no more or less likely to be uninsured simply because he or she lives in a rural county. Instead, it is the interrelated characteristics of individuals living in rural counties and employers in rural counties (compared to urban counties) that result in the observed differences in the distribution of health insurance coverage in Minnesota. There are many characteristics that result in an individual being more likely uninsured in urban and rural counties alike. For example, males, adults age 18 to 34, American Indians, Hispanics, those with lower income and less education, and those working for small employees are more likely to be uninsured regardless of where they live (see Appendix D for results of the multivariate analysis).

Access to coverage among the uninsured

Many uninsured individuals are eligible for insurance programs but do not enroll. Figure 3 presents estimates of potential sources (to the extent the survey allows us to assess eligibility) of insurance

coverage for the uninsured by region. There are no significant differences with respect to potential eligibility across region. Slightly more of the uninsured in rural non-adjacent counties are eligible for employer-sponsored insurance, while slightly more of the uninsured in rural adjacent counties are eligible for public insurance programs. The observed difference with respect to employer eligibility may be related to the lower rates of eligibility and take-up seen in rural as opposed to urban counties shown in Figure 2. Across the regions about six of every ten uninsured individuals are potentially eligible for public insurance programs. Only between 21% and 27% of the uninsured are not eligible for any type of health insurance coverage, indicating that the uninsurance rate could be dramatically reduced if all those who were potentially eligible enrolled.

Figure 3: *Potential sources of health insurance coverage among the uninsured, Minnesota, 2004.*

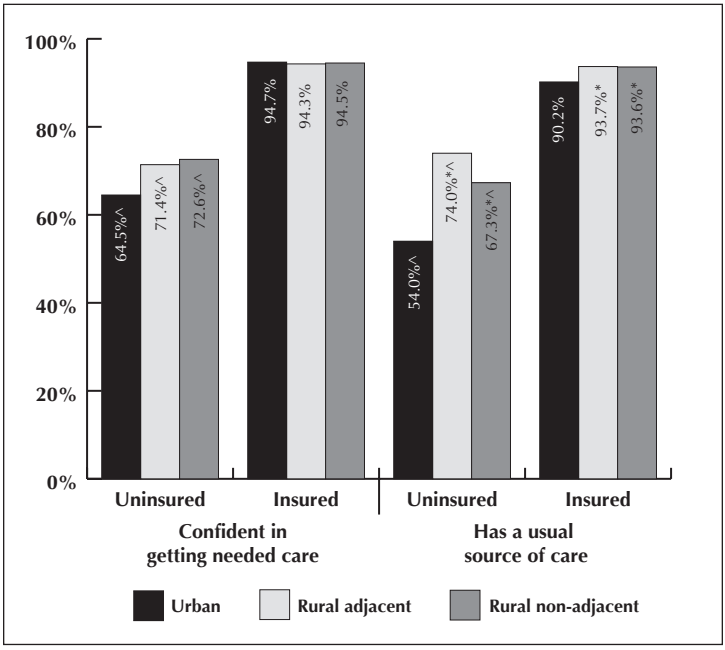


Source: 2004 Minnesota Health Access Survey
Note: None of the differences between geographic areas are significant at p<0.05

Relationship between coverage, usual source of care, and confidence in getting needed care

Health insurance coverage and access to care are related, but coverage does not guarantee access to health care, nor do all uninsured face barriers in obtaining needed care. For this reason, it is important to consider other measures of access across geographic counties. Figure 4 includes two measures of access: one's confidence in their ability to get future needed medical care and if an individual has a usual source of care. Across geographic regions in Minnesota, the uninsured are less likely to have a usual source of care and are less likely to be confident in their ability to get needed care. Greater than nine out of ten of insured Minnesotans across the state are confident and greater than nine out of ten report a usual source of care. This compares to closer to seven of ten of the uninsured who report the same. Although there are no urban-rural differences in

Figure 4: *Confidence in getting needed care and usual source of care by insurance coverage and geography, Minnesota, 2004.*



Source: 2004 Minnesota Health Access Survey
** Indicates statistically significant difference between urban and rural (adjacent and non-adjacent) counties at p<0.05*
^ Indicates statistically significant difference between uninsured and insured within geographic area at p<0.05

perceived confidence in getting needed care, rural residents, both insured and uninsured, are more likely to report a usual source of care. These relationships hold even when we control for other correlates of access. That is, rural residents are significantly more likely to report having a usual source of care even after factors associated with the likelihood of having a usual source of care are held constant (e.g., gender, age, race/ethnicity, income, health status, etc**;** see Appendix D for results of the multivariate analysis).

Summary and Conclusions

In comparing rates of uninsurance among non-elderly Minnesotans, we find that only in 2001 were residents of rural non-adjacent counties more likely to be uninsured than urban residents. Although the rate of uninsurance increased across all three geographic regions between 2001 and 2004, this increase over time was only significant in urban Minnesota, and the urban-rural difference was no longer significant in 2004. Other demographic factors and employment structures are more strongly associated with the likelihood of being uninsured than place of residence. This is in contrast to prior literature showing fairly consistent regional disparities in uninsurance (Coburn, McBride, and Ziller 2002; Eberhardt and Pamuk 2004; Hartley, Quam, and Lurie 1994; Hu, Duncan, Radcliff, Porter, and Hall 2006; Hueston 2000; Kaiser Commission on Medicaid and the Uninsured 2003). Interestingly, a recent Kaiser report indicates greater similarity in coverage between urban and rural adjacent counties, with the majority of significant differences being between urban and rural non-adjacent counties. Our data, on the other hand, indicate that adjacent and non-adjacent counties in Minnesota are more similar than different, with the primary contrasts being urban-rural differences.

Consistent with the literature, among those who are insured, rural residents are more likely to have self-purchased insurance and are less likely to have employer-sponsored insurance (Frenzen 1993; Hurley, Crawford, Praeger 2002; Larson and Hill 2005; Long, King, Coughlin 2006). Although the total rate of employment is the same across geographic regions, those employed in rural counties are more likely to be self-employed or work for small employers. The self-employed and those working for small employers are less likely to have an offer of employer-sponsored insurance. Thus, it makes sense that when we look at offers of employer-sponsored insurance, those in rural counties are less likely to have an offer, and when offered, they are less likely to be eligible. Low take-up rates in rural areas could be related to the higher concentration of people with low

incomes in rural counties. It follows from this that rural Minnesotans are also more likely to be covered by public insurance, with the increase in public coverage between 2001 and 2004 likely helping to hold the rise in uninsurance at bay within rural counties.

Across Minnesota, the uninsured are less likely to have a usual source of care and are less likely to be confident in their ability to get needed care, even when we control for other correlates of access such as income. This suggests that the uninsured are not "protected" by any type of community. However, as found in prior research (Hartley, Quam, and Lurie, 1994; Larson and Hill, 2005; Reschovsky and Staiti 2005), even when we control for health insurance coverage, those living in rural counties are more likely to have a usual source of care, suggesting that in rural communities the uninsured know where to go when they need care even if they may be less than confident about getting needed care.

In closing, the results of this study indicate that the issue of uninsurance is a statewide problem in Minnesota rather than solely a rural problem. Although those in rural areas are less likely to have access to insurance through an employer, rural residents appear to be able to obtain access to public insurance rather than join the ranks of the uninsured, and rural residents are more likely to have a regular provider despite lacking insurance than is true for urban residents. Thus, the good news is that policy interventions aimed at improving access to health insurance generally will help all Minnesotans rather than those living in specific regions of the state. However, policy solutions that focus on increasing offers, eligibility and affordability of employer sponsored insurance may be needed more in rural than urban counties across the state.

Endnotes

[1] Most persons age 65 and over are eligible for and enrolled in Medicare, with less than one half of one percent of elderly Minnesotans lacking health insurance coverage (Minnesota Department of Health, School of Public Health, 2006). Therefore, we limit our analysis to the non-elderly under 65 years of age.

[2] Based on Response Rate 4 of the American Association for Public Opinion Research 2004.

[3] Insurance status is based on self-reports or proxy responses to a series of questions listing different types of insurance. Like many other insurance surveys, the question series begins, "I am going to read you a list of different types of insurance…" the interviewer then read an exhaustive list of different types of insurance (i.e., Medicare, Medicaid, MinnesotaCare, employer sponsored insurance, self-

purchased private insurance, etc.). The respondent answered "yes," "no," or "don't know/not sure" to each type of insurance (with more than one type allowed). Following this complete list, if no coverage is reported, an uninsurance verification item was asked. Those still reporting no form of coverage are considered uninsured.

[4] This UIC categorizes rural counties based on the size of the largest city, its proximity (adjacency) to an urban area, and if adjacent, whether that urban area is large or small (based on population size).

References

American Association for Public Opinion Research. *Standard Definitions: Final Dispositions of Care Codes and Outcome Rates for Surveys.* 3rd ed. 2004. Lenexa, Kansas: AAPOR.

Berk M, Schur C. Measuring access to care: improving information for policymakers. *Health Affairs.* 1998; 17(1):180-186.

BrownM, Bindman A, Lurie N. Monitoring the Consequences of Uninsurance: A Review of Methodologies. *Medical Care Research and Review : MCRR* 1998; 55(2):177-210.

Coburn A, McBride T, Ziller E. Patterns of health insurance coverage among rural and urban children. *Medical Care Research and Review : MCRR; Medical Care Research and Review: MCRR* 2002: 59(3):272-292.

Committee on the Consequences of Uninsurance. *Care without coverage: too little, too late.* 2002. Washington, DC: National Academy Press.

DeNavas-Walt C, Proctor B, Lee C. *U.S. Census Bureau, Current Population Reports, P60-231, Income, Poverty, and Health Insurance Coverage in the United States: 2005.* 2006. Washington, DC: U.S. Government Printing Office.

Eberhardt M, Ingram D, Makuc D. *Urban and Rural Health Chartbook. Health, United States, 2001*. 2001. Hyattsville, MD: National Center for Health Statistics.

Eberhardt M, Pamuk E. The importance of place of residence: examining health in rural and nonrural areas. *American Journal of Public Health; American Journal of Public Health.* 2004; 94(10):1682-1686.

Edelman M, Menz B. Selected comparisons and implications of a national rural and urban survey on health care access, demographics, and policy issues. *The Journal of Rural Health.* 1996; 12(3):197-205.

Frenzen P. Health insurance coverage in U.S. urban and rural areas. *The Journal of Rural Health.* 1993; 9(3):204-214.

Hartley D, Quam L, Lurie N. Urban and rural differences in health insurance and access to care. *The Journal of Rural Health. 1994;* 10(2):98-108.

Hu H, Duncan R, Radcliff T, Porter C, Hall A. Variations in health insurance coverage for rural and urban nonelderly adult residents of Florida, Indiana, and Kansas. *The Journal of Rural Health.* 2006; 22(2):147-150.

Hueston W, Hubbard E. Preventive services for rural and urban African American adults. *Archives of Family Medicine; Archives of Family Medicine.* 2000; 9(3):263-266.

Hurley R, Crawford H, Praeger S. Medicaid and rural health care. *The Journal of Rural Health.* 2002; 18 Suppl:164-175.

Kaiser Commission on Medicaid and the Uninsured. *Health Insurance Coverage in Rural America, Chartbook.* 2003. Washington, DC: Kaiser Commission on Medicaid and the Uninsured.

Keeter S. Estimating telephone noncoverage bias from a phone survey. *Public Opinion Quarterly.* 1995; 59(2):196.

Larson S, Hill S. Rural-urban differences in employment-related health insurance. *The Journal of Rural Health.* 2005; 21(1):21-30.

Long S, King J, Coughlin T. The health care experiences of rural Medicaid beneficiaries. *Journal of Health Care for the Poor and Underserved.* 2006;17(3):575-591.

Minnesota Department of Health, Health Economic Program and University of Minnesota School of Public Health. *Health Insurance Coverage in Minnesota: Trends from 2001 to 2004.* 2006. Available at: www.shadac.umn.edu/img/assets/18528/MNAccess2004Reprt.pdf

Olson L, Tang S, Newacheck P. Children in the United States with discontinuous health insurance coverage. *The New England Journal of Medicine.* 2005; 353(4):382-391.

Ormond B, Zuckerman S, Lhila, A. Rural/Urban Difference in Health Care Are Not Uniform Across States. *Assessing the New Federalism.* Urban Institute. 2000; No. B-11.

Reschovsky J, Staiti, A. Access and quality: does rural America lag behind? *Health Affairs.* 2005; 24(4):1128-1139.

StataCorp. *Stata Statistical Software, v. 8.2*. 2003. College Station, Texas: StataCorp.
Stoddard J, St. Peter R, Newacheck, P. Health insurance status and ambulatory care for children. *The New England Journal of Medicine.* 1994; 330(20):1421-1425.

U.S. Census Bureau. *U.S. Census Bureau Guidance on the Presentation and Comparison of Race and Hispanic Origin Data.* 2003. Available at: www.census.gov/population/www.socdemo/compraceho.html.

U.S. Census Bureau, Census of Housing. *Historical Census of Housing Tables: Telephones.* 2004. Accessed: February 24, 2005. Available at: www.census.gov/hhess/www/housing/census/historic/phone.html.

U.S. Census Bureau. *2000 Census of Population and Housing. Generated using American Fact Finder.* 2000. Generated December 8, 2006. Accessible at: http://factfinder.census.gov.

U.S. Census Bureau. *2004 Census of Population and Housing. Generated using
American Fact Finder.* 2005. Generated December 8, 2006. Accessible at: http://factfinder.census.gov.

U.S. Department of Agriculture Economic Research Service. *ERS/USDA Briefing Room - Measuring Rurality: Rural-Urban Continuum Codes.* Available at: www.ers.usda.gov/briefing/rurality/UrbanInf/

Appendix A: Designation of Urban, Rural Adjacent, and Rural Non-Adjacent by County in Minnesota

Urban Counties	Rural, Adjacent Counties	Rural, Not Adjacent Counties
Anoka	Aitkin	Beltrami
Benton	Becker	Big Stone
Carlton	Clearwater	Blue Earth
Carver	Fillmore	Brown
Chisago	Goodhue	Cass
Clay	Itasca	Chippewa
Dakota	Kanabec	Cook
Dodge	Kandiyohi	Cottonwood
Hennepin	Lake	Crow Wing
Houston	Le Sueur	Douglas
Isanti	Mahnomen	Faribault
Olmsted	Marshall	Freeborn
Polk	McLeod	Grant
Ramsey	Meeker	Hubbard
Scott	Mille Lacs	Jackson
Sherburne	Morrison	Kittson
St. Louis	Mower	Koochiching
Stearns	Norman	Lac qui Parle
Wabasha	Otter Tail	Lake of the Woods
Washington	Pennington	Lincoln
Wright	Pine	Lyon
	Pipestone	Martin
	Pope	Murray
	Red Lake	Nicollet
	Rice	Nobles
	Rock	Redwood
	Sibley	Renville
	Todd	Roseau
	Wilkin	Steele
	Winona	Stevens
		Swift
		Traverse
		Wadena
		Waseca
		Watonwan
		Yellow Medicine

Source: USDA, Economic Research Service

Appendix B: Operational Definitions of Variables

The survey includes questions about key demographic variables (i.e., age, race/ethnicity, marital status, income, education), self-reported health status, and employment information (i.e., employment status, hours worked, size of employer). In the analysis, age is divided into four categories: under 6 years of age, 6-17, 18-34 and 35-64 year olds.

To measure race and ethnicity, respondents were first asked to identify their ethnicity, and then asked to identify their race; multiple-responses to the race question are permitted. Both measures are used to identify a respondent's race and ethnicity. For the most part, race and ethnic groups are defined using the Census Bureau's "any race" construction (US Census Bureau, 2003). An individual is categorized as belonging to a specific racial or ethnic group if they report their race or ethnicity either alone or in combination with another race or ethnicity. Individuals reporting more than one race or ethnic identity are counted as belonging to all reported groups.[1] Therefore, counts obtained from the "any race" construction will total more than the population total for the state of Minnesota and percentages will sum to more than 100%. Due to the small number of individuals providing a race or ethnic identity response other than the Census Bureau categories (i.e., Black, American Indian, Asian, White, or Hispanic), the "other" race category is omitted from this report.[2] We include an indicator of nativity in the analysis telling whether the respondent is US born or born outside the US.

Marital status is coded as "married" or "not married" if the respondent reported living with a partner, or being single, divorced, separated, or widowed. Marital status was not collected for children under 18 years old. However, when a child was randomly selected as the target of the survey, the interviewer did ask for the educational attainment of the "primary wage earner." If the respondent could not name the primary wage earner, this question was asked about the person responsible for the care of the selected child. The education status variable is divided into four categories: high school graduate or less, high school graduate, some college, college graduate or more (i.e., post graduate degree).

Data collected on family income is recoded into measures of poverty status and divided into five categories: at or below 100% of the federal poverty level (FPL); 101- 200% of FPL; 201-300; 301-400; and, over 400% of the FPL. Self-reported health status is recoded from five categories to two representing respondents reporting they are in excellent, very good, or good health as compared to those reporting fair or poor health.

We include several employment-related variables in the analysis. As with educational attainment, when the randomly selected individual in the household was a child, this information was gathered for the primary wage earner or responsible adult. The first variable is employment status representing respondents who are either employed or not (including full-time students, unpaid workers, retirees and unemployed individuals). The second variable denotes whether the respondent is self-employed or employed by someone else. In addition, we include a variable indicating if the respondent has one or more than one job and a variable indicating full-time employment based on a response of 35 hours or more to the question of how many hours are worked per week at the job worked at the most hours. We also include a variable specifying whether the job is permanent as opposed to temporary or seasonal. Due to the relationship between offers of insurance and firm size, responses to questions of the size of the respondent's employer are classified into three categories oriented toward small employers: 10 or less employees, 11-50 employees, or more than 50 employees at all locations.

[1] In 2004, 1.4% of respondents to the MNHA survey reported more than one race. This is consistent with the number of Minnesotans who report multiple races according to the U.S. Census Bureau. In 2000, according to this source, 1.7% Minnesotans report multiple races. Source: U.S. Census Bureau, 2000. *Census 2000 Demographic Profile Highlights: Minnesota*. Available at: http://factfinder.census.gov/home/saff/main.HTML?_lang=en

[2] In 2001, 110 individuals (0.4%) reported a race/ethnicity other than White, Black, American Indian, Asian, or Hispanic. In 2004, there were 37 individuals (0.1%) who reported another race/ethnicity.

Appendix C: Analysis Strategy

The MNHA data are weighted to match population control totals to account for the fact that not all of the survey respondents were selected with the same probability. We first present weighted estimates of the rates of health insurance coverage and offer, eligibility and take-up of employer sponsored insurance across rural non-adjacent, rural adjacent and urban counties. We present weighted population characteristics of the residents in each of these regions as well as rates of uninsurance associated with important demographic and economic covariates within each region. In addition, we provide weighted estimates of the proportion of uninsured who appear to be eligible for some form of private or

public insurance coverage. Finally, we present the results from a multivariate analysis predicting insurance coverage by geographic region, controlling for known demographic and employment covariates of health insurance. As we are also interested in the relationships between health insurance, access to care, and geographic region, we perform analysis predicting each of the two access variables, controlling for health insurance coverage along with the same set of covariates. For this analysis we use logistic regressions as the outcomes of interest are dichotomous. All analyses are performed using STATA statistical software (StataCorp, 2003) which adjusts standard errors to account for the complex survey design. Significant differences are reported across years, when available, and between urban and rural counties on all exhibits. Unless stated otherwise, all differences discussed in the text are significant at $p<0.05$.

Appendix D: Results of Multivariate Analysis

Uninsurance, No Usual Source of Care, and Not Confident in Ability to Access Needed Care: Results from Three Logistic Regressions, Minnesota, 2004.

	Uninsured			No Usual Source of Care			Not Confident		
	Odds Ratio	Std. Err.		Odds Ratio	Std. Err.		Odds Ratio	Std. Err.	
Uninsured	-	-		5.091	0.665	***	5.868	0.809	***
Rural, Adjacent	1.000	0.154		0.625	0.097	**	0.845	0.128	
Rural, Non-Adjacent	0.895	0.133		0.650	0.095	**	0.813	0.117	
Male	1.321	0.140	**	2.515	0.244	***	1.190	0.128	
6 to 17	0.739	0.184		2.977	1.149	**	1.568	0.501	
18 to 34	2.906	0.661	***	17.790	6.394	***	2.651	0.790	***
35 to 64	1.398	0.320		8.269	2.967	***	3.063	0.881	***
Black	1.124	0.256		1.353	0.287		1.023	0.247	
American Indian	2.422	0.585	***	0.837	0.316		1.514	0.443	
Asian	0.918	0.287		1.279	0.351		0.735	0.267	
Hispanic	2.577	0.534	***	1.588	0.362	*	0.661	0.183	
Other Race	1.190	1.056		3.856	2.812		2.995	2.127	
Not US Born	1.001	0.207		1.175	0.231		2.275	0.550	***
<100% FPL	7.244	1.552	***	1.666	0.280	**	2.224	0.420	***
101-200%	6.936	1.342	***	1.332	0.205		2.987	0.496	***
201-300%	4.019	0.749	***	1.443	0.194	**	1.698	0.268	***
301-400%	2.339	0.462	***	1.151	0.146		1.591	0.252	**

Continued next page

<High School	3.706	0.815	***	1.190	0.254		1.262	0.311	
High School Graduate	2.684	0.435	***	0.661	0.085	***	1.311	0.193	
Some College	1.656	0.258	***	0.693	0.077	***	1.182	0.160	
Fair or Poor Health	0.997	0.166		0.813	0.137		4.155	0.593	***
Self-Employed	0.924	0.205		0.994	0.208		1.147	0.249	
Part-time Worker (<35 hrs/week)	1.262	0.175		0.708	0.097	*	0.868	0.135	
10 or fewer employees	1.775	0.321	**	1.210	0.203		1.164	0.216	
11-50 Employees	1.346	0.216		1.177	0.166		1.153	0.181	

Note: The odds of not having a usual source of care for adults 18-34 and 35-64 year old relative to children 0-5 years old are unusually high. The validity of these estimates were checked in bivariate relationships and using a stepwise series of linear regression models. We found that these estimates reflect the true nature of the data rather than a problem of correlation within this logistic regression model.
Source: 2004 Minnesota Health Access Survey
** Significant at p<0.05*
*** Significant at p<0.01*
****Significant at p<0.001*

MinnesotaCare: Key Trends & Challenges

Julie Sonier

In 1992, Minnesota enacted a sweeping health care reform bill to improve access to and affordability of health insurance coverage, with the goal of reaching universal health insurance coverage in the state by 1997. One of the cornerstones of the 1992 legislation (originally called the Health Right Act and later renamed the MinnesotaCare Act) was the creation of MinnesotaCare, a health insurance program for low- and moderate-income working people who are not eligible for Medical Assistance or other public programs and who cannot afford private insurance coverage.[1] This article provides background information on the MinnesotaCare program and how it has changed over time, presents data on recent trends in enrollment, describes how enrollment and demographic characteristics of MinnesotaCare enrollees vary by region of the state, and discusses evidence related to whether the program has reached its target populations. It concludes with observations about some of the current challenges facing the state as it tries to ensure access to affordable health insurance and reduce the number of uninsured.

The MinnesotaCare program was enacted as just one of a series of major reforms aimed at improving health insurance availability and affordability in Minnesota. Other major components of the original MinnesotaCare legislation included the following:

- Statewide limits on health care cost growth and mechanisms to control health care capital expenditures;
- In the small employer group health insurance market, reforms guaranteeing availability of coverage, renewability

The author expresses appreciation to George Hoffman and Shawn Welch at the Minnesota Department of Human Services for providing much of the data used in this analysis.

of coverage, and restricting the degree to which premiums can vary based on factors such as age, health status, and region;

- In the individual insurance market, laws guaranteeing renewability of coverage and restricting premium variation; and
- The formation of voluntary health insurance pools for public employers and small employers.

While some of these components of health reform were later scaled back or repealed, it is important to remember that the MinnesotaCare program was part of a broad package of reforms aimed at controlling health care costs and achieving universal health insurance coverage.

MinnesotaCare History

MinnesotaCare was established in 1992 to provide a source of subsidized health insurance coverage to Minnesota's low- and moderate-income working families. MinnesotaCare replaced the Children's Health Plan, which had been established in 1987 to provide health insurance for low-income children who did not qualify for coverage through Medicaid. Beginning in October 1992, parents of children in families with incomes at or below 185% of federal poverty guidelines (FPG) became eligible to enroll in MinnesotaCare. The income limit for families was raised to 275% of

Table 1: *Income eligibility for MinnesotaCare, 2006.*

	Income limit for:	
Number of people in household	**Families With Children**	**Adults Without Children**
1	$26,950	$17,150
2	$36,300	$23,100
3	$45,650	NA
4	$55,000	NA
5	$64,350	NA

Based on 2006 HHS Poverty Guidelines. NA = not applicable. Parents in families with incomes above $50,000 per year are not eligible to enroll in MinnesotaCare.

FPG in January 1993, and in 2003, the eligibility limit for parents was changed to the lesser of 275% of FPG or annual income of $50,000.

Adults in households without children became eligible to enroll in MinnesotaCare in October 1994, with an income limit of up to 125% of FPG. The income limit was raised to 135% of FPG in 1996 and to 175% of FPG in 1997. Table 1 summarizes current MinnesotaCare income eligibility guidelines for families and adults without children.

MinnesotaCare was not intended to replace or substitute for private health insurance coverage. Instead, it was intended to provide a source of coverage for low- and moderate-income families who do not have access to employer-sponsored health insurance. The program includes several mechanisms that are intended to reduce the potential for "crowd-out" (enrollees moving from the private insurance market to a public program). With some exceptions, a person may enroll in MinnesotaCare if he or she has been without health insurance for the previous four months and has not had access to employer-subsidized health insurance coverage through a current employer for the previous eighteen months.[2] ("Employer-subsidized" health insurance is defined as coverage for which an employer contributes at least 50% of the premium cost.) Households with assets exceeding certain limits ($10,000 for a one-person household and $20,000 for households of two or more people) are also not eligible for MinnesotaCare.[3] In addition, the program's sliding scale premium structure, which requires higher enrollee premiums at higher income levels, is intended to encourage families to transition to private health insurance coverage at higher income levels.

Generally speaking, the MinnesotaCare benefit set is quite comprehensive, but there are some significant exceptions. Adults without children and parents in households with incomes above 175% of FPG have a $10,000 annual limit on coverage for inpatient hospitalizations. In response to a state budget shortfall in 2003, benefits for adults were changed: new co-payments and higher premiums were required for all adult enrollees. In addition, a new "Limited Benefit Set" with a $5,000 annual limit on coverage for outpatient services was implemented for adults without children with incomes between 75% and 175% of FPG. (The $5,000 cap on outpatient services was repealed by subsequent legislation in 2005, but other aspects of the limited benefit set remain in effect.)

Table 2: *MinnesotaCare enrollment and spending history.*

State Fiscal Year	Avg. Monthly Enrollment	Total Spending ($ millions)	Avg. Monthly Spending Per Enrollee	Growth in:		
				Enrollment	Total Spending	Spending Per Enrollee
1993*	35,217	$13	$30			
1994	62,232	$33	$45	76.7%	159.6%	46.9%
1995	77,417	$56	$60	24.4%	69.0%	35.9%
1996	88,277	$80	$75	14.0%	41.7%	24.3%
1997	93,136	$98	$88	5.5%	23.2%	16.8%
1998	97,854	$108	$92	5.1%	10.5%	5.2%
1999	106,552	$164	$129	8.9%	51.7%	39.3%
2000	108,999	$187	$143	2.3%	13.8%	11.2%
2001	122,247	$240	$164	12.2%	28.3%	14.4%
2002	138,022	$351	$212	12.9%	46.3%	29.6%
2003	151,205	$435	$240	9.6%	23.8%	13.0%
2004	148,505	$487	$273	-1.8%	11.9%	14.0%
2005	141,822	$409	$240	-4.5%	-16.1%	-12.1%
2006	128,733	$438	$284	-9.2%	7.3%	18.2%

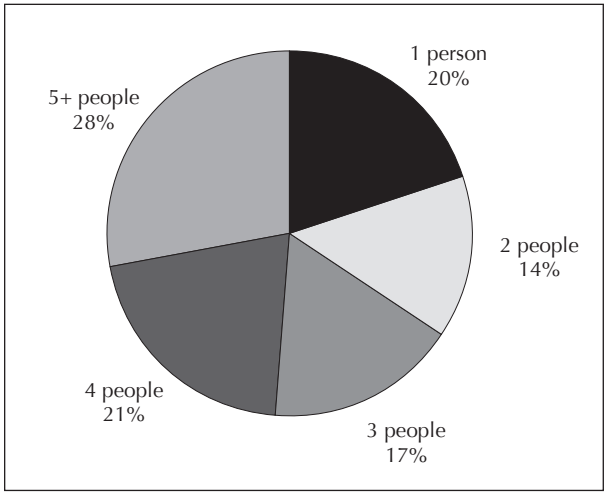
Source: Minnesota Department of Human Services. Note: a change in timing of payments caused growth in total spending and spending per enrollee to be lower in 2001 and higher in 2002 than would otherwise have been the case.
**Includes Children's Health Plan.*

Trends in MinnesotaCare Enrollment at the State Level

Enrollment in MinnesotaCare grew steadily through the 1990s and the early part of this decade, as shown in Table 2. In the state's fiscal year 1993, average monthly enrollment in MinnesotaCare was about 35,000. Ten years later, average monthly enrollment in the program had nearly tripled to over 151,000. Program spending grew steadily as well, from about $13 million in fiscal year 1993 to $435 million in 2003.[4]

Overall, about 45% of MinnesotaCare enrollees are children (under age 21), 31% are parents in households with children, and the remaining 24% are adults without children. This distribution by enrollment category has been fairly stable over time, although the percentage of enrollees who are children has declined slightly (from

Figure 1: *MinnesotaCare enrollment by household size as of July 2006.*



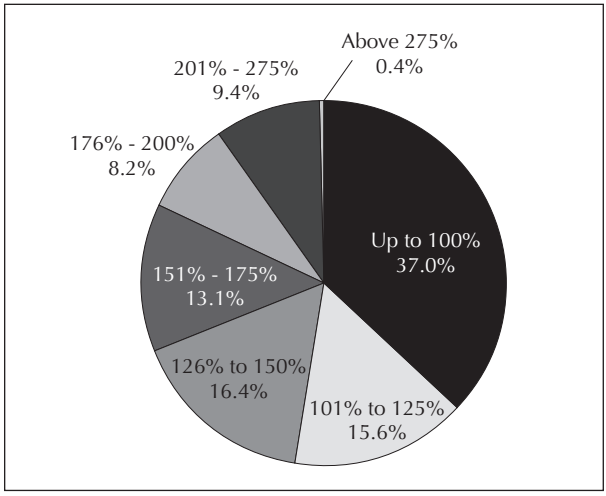


Figure 2: *Income distribution of MinnesotaCare enrollment, July 2006 (income as percent of federal poverty guidelines).*

48.6% in July 2001 to 45.0% in July 2006) and the percentage who are adults without children has increased (from 19.5% in July 2001 to 23.7% in July 2006). Figure 1 illustrates how enrollment varies by household size: nearly half (49%) of enrollees are in households with four or more people; however, the share of total enrollment

Figure 3: *MinnesotaCare enrollment trends by family type.*

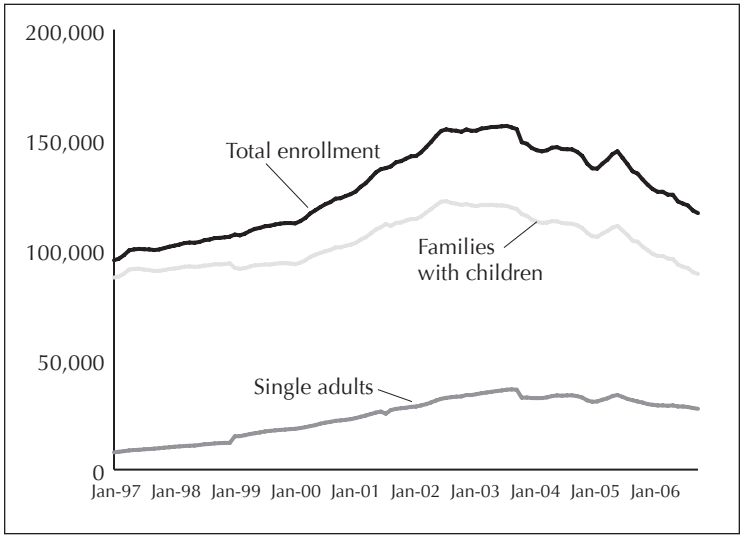
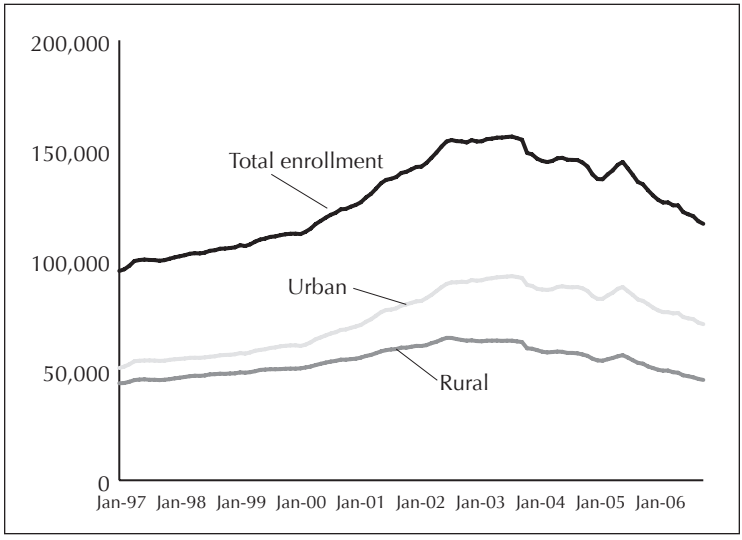


Figure 4: *Urban and rural MinnesotaCare enrollment trends.*



accounted for by one-person households increased from about 13% in 2000 to 20% in 2006.

Over 90% of MinnesotaCare enrollees have family incomes below 200% of federal poverty guidelines, as shown in Figure 2. Among families with children, the income distribution of MinnesotaCare enrollees is slightly higher than for the program

overall because of higher income eligibility cutoffs for this group. Still, nearly two-thirds of children in this enrollment category have incomes below 150% of FPG, the income cutoff for Medicaid eligibility. The income distribution of MinnesotaCare enrollment for families with children has been stable over the past several years, although there has been a slight increase in the share of enrollment at the upper end of the income distribution.

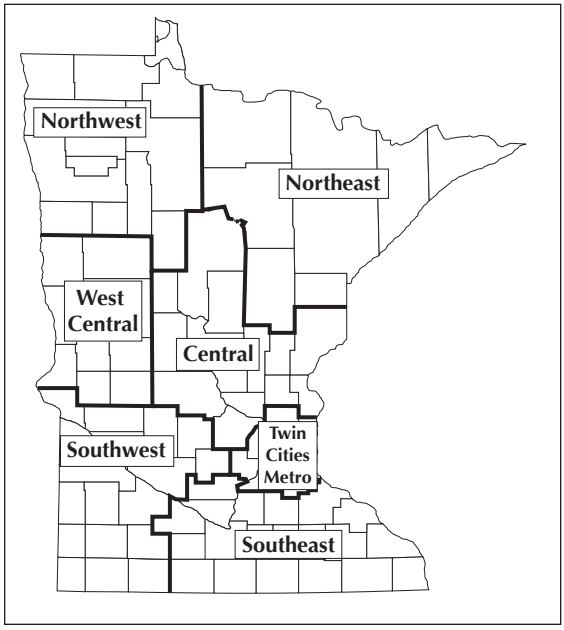
Figures 3 and 4 illustrate how enrollment in MinnesotaCare has changed over time. Figure 3 shows monthly changes in enrollment by family type (families with children and single adults), while Figure 4 shows enrollment trends in urban and rural counties.[5] As the figures show, MinnesotaCare enrollment grew steadily among both family types and in both urban and rural parts of the state, peaking in July 2003, then steadily declining. As noted earlier, changes were made to program eligibility requirements and premiums in 2003. In addition to the eligibility and benefit changes described above, verification of continued eligibility for enrollment was changed from every 12 months to every six months. Also, mandatory verification of access to employer-sponsored insurance was implemented in April 2006. In combination, all of these changes have clearly had an impact on program enrollment.

Table 3: *Regional variation in MinnesotaCare enrollment.*

	Share of Nonelderly Population	**Share of MNCare Enrollment**
Urban Counties	73.9%	60.7%
Rural Counties	26.1%	39.3%
Region		
Northeast	6.0%	9.6%
Northwest	3.1%	6.2%
Central	13.5%	19.1%
West Central	4.0%	6.4%
Southwest	5.2%	6.9%
Southeast	13.4%	11.1%
Metropolitan	54.8%	40.6%

Data sources: MinnesotaCare enrollment data for July 2005 from Minnesota Department of Human Services, county population estimates for July 2005 from U.S. Bureau of the Census.

Figure 5: *Minnesota regions.*



Regional Variations in Enrollment

Previous research has documented substantial variation in the availability of employer-based health insurance by region in Minnesota. For example, the percentage of people who have employer-based health insurance coverage is highest in the Twin Cities and ranges from 44% to 67% across the state's 13 economic development regions.[6] Employers in the Twin Cities metropolitan area are more likely to offer coverage than those in other metropolitan areas, and rural employers are the least likely to offer coverage.[7] Because of these regional variations in access to employer-based health insurance and other factors (such as regional variation in income), it is not surprising that MinnesotaCare enrollment is concentrated more heavily in some regions than others. Table 3 presents a regional analysis of the distribution of Minnesota's nonelderly population and the distribution of MinnesotaCare enrollment. As the table shows, for example, about 26% of the state's nonelderly population lives in rural counties, but 39% of MinnesotaCare enrollment is in rural counties. Enrollment is particularly concentrated in the Northwest, where the region's share of statewide MinnesotaCare enrollment (6.2%) is about twice as high as the region's share of non-elderly population (3.1%). The difference

Table 4: *Enrollment by family type and region, July 2006.*

				Percent of total:	
	Families with Children	**Single Adults**	**Total Enrollment**	**Families with Children**	**Single Adults**
Statewide	91,601	28,453	120,054	76.3%	23.7%
Urban Counties	54,916	18,324	73,240	75.0%	25.0%
Rural Counties	36,685	10,129	46,814	78.4%	21.6%
Region					
Northeast	8,146	3,268	11,414	71.4%	28.6%
Northwest	5,855	1,489	7,344	79.7%	20.3%
Central	18,207	4,639	22,846	79.7%	20.3%
West Central	5,983	1,574	7,557	79.2%	20.8%
Southwest	6,589	1,651	8,240	80.0%	20.0%
Southeast	9,896	3,388	13,284	74.5%	25.5%
Metropolitan	36,898	12,437	49,335	74.8%	25.2%

Data source: Minnesota Department of Human Services

between MinnesotaCare enrollment distribution and population distribution is also particularly high in the Northeast and West Central regions (each of these regions has a share of MinnesotaCare enrollment about 1.6 times higher than its share of the nonelderly population). The map in Figure 5 illustrates the regional definitions used for this analysis.

There is also substantial variation across regions in MinnesotaCare enrollment by family type, as shown in Table 4. Statewide, families with children account for about 76% of MinnesotaCare enrollees; this proportion is slightly lower (75%) in urban counties and slightly higher (78%) in rural ones. In the Northeast, Southeast, and Metropolitan (Twin Cities) regions — which include nearly all of the counties defined as urban in this analysis — enrollment among single adults accounts for a higher share of MinnesotaCare enrollment than in other regions of the state.

Table 5 illustrates MinnesotaCare enrollment trends by region over time, in terms of both the number of enrollees and enrollment as a share of the region's nonelderly population. Statewide, MinnesotaCare enrollment as a share of the nonelderly population peaked at 3.5% in 2003, then declined to 2.6% in 2006. As the table shows, rural counties have historically had a higher share of their nonelderly populations enrolled in MinnesotaCare compared to urban counties. MinnesotaCare enrollment as a share of the

Table 5: *Regional variation in MinnesotaCare enrollment trends.*

	2000	2001	2002	2003	2004	2005	2006
Statewide Total							
Enrollment	120,666	137,045	154,664	156,230	145,617	138,809	120,054
Enrollment as % of nonelderly population	2.8%	3.1%	3.5%	3.5%	3.2%	3.1%	2.6%
Urban Counties							
Enrollment	66,713	77,579	89,958	92,780	87,724	84,236	73,240
Enrollment as % of nonelderly population	2.1%	2.4%	2.8%	2.8%	2.7%	2.5%	2.2%
Rural Counties							
Enrollment	53,953	59,466	64,706	63,450	57,893	54,573	46,814
Enrollment as % of nonelderly population	4.7%	5.1%	5.6%	5.4%	4.9%	4.6%	4.0%
	2.6%	2.7%	2.8%	2.6%	2.3%	2.1%	1.8%
Region	2.2	2.1	2.0	1.9	1.9	1.8	1.8
Enrollment							
Northeast	13,399	14,919	16,310	15,813	14,396	13,353	11,414
Northwest	8,898	9,996	10,764	10,476	9,311	8,606	7,344
Central	22,302	25,187	28,767	29,357	27,916	26,509	22,846
West Central	9,009	9,904	10,571	10,206	9,325	8,827	7,557
Southwest	10,050	10,767	11,697	11,092	10,116	9,646	8,240
Southeast	13,507	15,122	17,182	17,548	16,081	15,436	13,284
Metropolitan	43,464	51,064	59,284	61,651	58,364	56,350	49,335
Enrollment as % of nonelderly population							
Northeast	5.0%	5.5%	6.1%	5.9%	5.4%	5.0%	4.3%
Northwest	6.4%	7.2%	7.8%	7.5%	6.6%	6.1%	5.2%
Central	4.1%	4.5%	5.0%	5.0%	4.7%	4.4%	3.7%
West Central	5.2%	5.7%	6.0%	5.8%	5.2%	4.9%	4.2%
Southwest	4.3%	4.6%	5.0%	4.7%	4.3%	4.1%	3.5%
Southeast	2.3%	2.6%	2.9%	2.9%	2.7%	2.6%	2.2%
Metropolitan	1.8%	2.1%	2.4%	2.5%	2.4%	2.3%	2.0%

Data source: Minnesota Department of Human Services, July enrollment figures for each year. Population estimates from U.S. Bureau of the Census for July 1 each year through 2005; 2006 population was estimated using growth rates from 2004 to 2005.

Table 6: *Changes in MinnesotaCare enrollment, 2003 to 2006.*

	Total Enrollment	Families with Children	Single Adults
Statewide	-23.2%	-23.6%	-21.7%
Urban Counties	-21.1%	-21.8%	-18.7%
Rural Counties	-26.2%	-26.1%	-26.6%
Region			
Northeast	-27.8%	-26.5%	-30.9%
Northwest	-29.9%	-28.7%	-34.2%
Central	-22.2%	-22.6%	-20.3%
West Central	-26.0%	-26.6%	-23.6%
Southwest	-25.7%	-26.3%	-23.1%
Southeast	-24.3%	-25.5%	-20.5%
Metropolitan	-20.0%	-20.9%	-17.3%

Data source: Minnesota Department of Human Services, enrollment data for July 2003 and July 2006.

nonelderly population is about twice as high in rural counties as in urban ones, but this difference has narrowed over time. In 2006, residents of rural counties were about 1.8 times more likely to be enrolled in MinnesotaCare than their urban counterparts. The Northwest region has historically had a higher percentage of its nonelderly population enrolled in MinnesotaCare than any other region (as high as 7.8% in 2002 but declining to 5.2% in 2006), while the Metropolitan region has historically had the lowest percentage.

Since the peak in 2003, enrollment in MinnesotaCare has declined broadly across family types and across all regions of the state, as described in Table 6. In the state as a whole, MinnesotaCare enrollment declined by about 23% between July 2003 and July 2006; enrollment declined by 24% among families with children and 22% among single adults. Enrollment declines were larger in rural counties than urban counties (-26% compared to -21%). Total enrollment declines were largest in the Northwest and Northeast regions (-30% and -28%, respectively). Each of these regions experienced larger than average declines in enrollment by families with children as well as single adults.

MinnesotaCare's Impact on Health Insurance Coverage

Several different types of research studies have attempted to evaluate MinnesotaCare's success at reaching its primary target populations, children and the low-income working uninsured. For example, one study using data on the demographics of Minnesota's uninsured population showed that although the overall rate of uninsurance in Minnesota was stable between 1990 and 1995 (before and after implementation of MinnesotaCare), children and low-income people represented a smaller share of the uninsured in 1995 than in 1990.[8] In addition, researchers documented a statistically significant decline between 1990 and 1995 in the share of Minnesota children who were uninsured for a year or longer.[9] Another research study evaluated the impact of MinnesotaCare's implementation on the level of uncompensated hospital care in Minnesota, concluding that increases in MinnesotaCare enrollment had resulted in a $58.6 million reduction in uncompensated hospital care costs from 1992 through 1996.[10]

Other studies have analyzed the degree to which public insurance programs like MinnesotaCare have resulted in "crowd-out" of private insurance. Although most studies have found that expanding eligibility for public programs usually results in some substitution of public coverage for private insurance, findings on the size of this effect vary widely.[11] In general, studies that have specifically attempted to evaluate crowd-out due to MinnesotaCare have found very little evidence of it.[12]

Remaining Challenges

While the research evidence discussed above suggests that MinnesotaCare has been successful at reaching its target populations, reducing the need for uncompensated hospital care, and minimizing crowd-out of private insurance, there is still significant room for improvement. An estimated 59% of uninsured Minnesotans are potentially eligible for public insurance coverage (either MinnesotaCare, Medicaid, or General Assistance Medical Care); among uninsured children, an estimated 78% are potentially eligible for public coverage.[13] In other words, as many as 225,000 uninsured Minnesotans are potentially eligible for public insurance programs but are not enrolled. There are many reasons why people who are eligible for public programs may not enroll: many people are either not aware of the programs or their own potential eligibility, while others may not believe they need insurance, may find the paperwork too confusing or difficult, or may consider even the subsidized

sliding-scale premiums too expensive.[14]

There are clear tradeoffs between making it easier for people who are eligible to enroll in public programs and achieving other important goals such as minimizing private market crowd-out and maintaining program integrity (i.e., ensuring that the program only enrolls people who meet all of the requirements). A 2003 program evaluation of MinnesotaCare by the Minnesota Office of the Legislative Auditor found that eligibility determination staff made errors in determining MinnesotaCare applicants' income about one third of the time, and also that many applicants misreported information on the availability of employer-sponsored insurance.[15] Recent changes in program eligibility, combined with enhanced efforts to minimize crowd-out and ensure program integrity, have increased the length of the application from four to 24 pages.

Minnesota has historically had among the lowest uninsurance rates of any state in the United States.[16] One key reason for the state's low rate of uninsurance has been Minnesota's historically strong rate of private health insurance coverage. In recent years, however, the rate of private coverage has declined: between 2001 and 2004, the share of Minnesotans with private health insurance declined from 68.4% to 62.9%. During the same period, coverage in public programs rose from 21.2% of the population to 25.1%, while the rate of uninsurance rose from 5.7% to 7.4%.[17] While public program enrollment was rising, the state was also facing pressure from rising costs per enrollee, similar to trends experienced in the private sector. These two trends combined were among the primary factors that led to a large state budget shortfall and the changes in program eligibility and benefits that were enacted in 2003. Maintaining and supporting the strength of private health insurance markets, while providing access to coverage for those who otherwise could not afford it, will be one of the keys to ensuring continued access to affordable health insurance coverage for Minnesotans into the future.

Finally, maintaining balance between providing access to coverage for those who lack access and encouraging reliance on private market options for higher income enrollees is also a challenge. Currently, MinnesotaCare premiums are set at 9.8% of family income at the high end of the program's income eligibility range. One recent national study found that average employee contributions to health insurance premiums are less than 5% of income for families with incomes at 300% of federal poverty guidelines.[18]

Families who have access to employer coverage where the employer contributes at least 50% of the premium cost are

ineligible for MinnesotaCare, but 50% of a family premium may be unaffordable for many families. Based on an average annual premium of $11,480 for family coverage,[19] a family whose employer contributes 50% of the cost would pay $5,740 annually, or nearly $480 a month, in health insurance premiums. For a hypothetical family of four with an income at 200% of federal poverty guidelines ($40,000 in 2006), 50% of the family premium represents about 14.4% of the family's income. The family could also face significant out-of-pocket expenses such as deductibles, copayments, and coinsurance (which have all been increasing in recent years as employers have adopted strategies to control increases in health insurance premiums).

While there is no widely agreed-upon definition of what constitutes "affordable" health insurance coverage, it is clear that rising health care costs have placed significant pressure on family budgets in recent years, and this pressure is likely to continue into the future. Similar to the challenges that Minnesota faced in the early 1990s when the MinnesotaCare program was enacted, ensuring continued strength of private health insurance markets and ensuring that public insurance programs continue to provide a safety net of affordable coverage for those who would otherwise not have access to coverage will continue to be key strategies in efforts to increase the number of Minnesotans with health coverage.

Endnotes

[1] Medical Assistance is Minnesota's name for Medicaid, a state-federal health insurance program for certain low-income, elderly, and disabled populations.
[2] There is an exception to this provision for children in families with incomes below 150% of FPG, and for people transitioning from other public insurance programs.
[3] The asset limit does not apply to children or pregnant women.
[4] MinnesotaCare has three financing sources: enrollee premiums, federal matching payments for certain enrollees (since 1995), and the Health Care Access Fund, which receives revenues primarily from a 2% health care provider tax and a 1% tax on non-profit health plan premiums. In fiscal year 2006, 8% of program costs were paid by enrollee premiums, 34% by federal matching payments, and the remaining 57% by state funds.
[5] For this analysis, urban counties are defined as counties that are part of a Metropolitan Statistical Area (MSA) as defined by the U.S. Office of Management and Budget. All other counties are defined as rural.
[6] Minnesota Department of Health, Health Economics Program and University of Minnesota School of Public Health, "Health Insurance Coverage in Minnesota: Trends From 2001 to 2004," February 2006.
[7]Minnesota Department of Health, Health Economics Program, "Employer-Based Health Insurance in Minnesota: Results from the 2002 Employer Health Insurance Survey," Issue Brief 2005-01, March 2005.
[8] Minnesota Department of Human Services and Minnesota Department of Health, "The MinnesotaCare Program: Transition Plan," March 1998, using data from the University of Minnesota School of Public Health's 1990 and 1995 Minnesota Health Access Surveys.
[9] Kathleen Thiede Call, Nicole Lurie, Yvonne Jonk, Roger Feldman, and Michael Finch, "Who is Still Uninsured in Minnesota? Lessons From State Reform Efforts," *Journal of the American Medical Association*, vol. 278, no. 14, October 8, 1997.
[10] Lynn A. Blewett, Gestur Davidson, Margaret E. Brown, and Roland Maude-Griffin, "Hospital Provision of Uncompensated Care and Public Program Enrollment," *Medical Care Research and Review*, vol. 60 no. 4, December 2003.
[11] See, for example, Julie L Hudson et al., "The Impact of SCHIP on Insurance Coverage of Children," *Inquiry*, vol 42 no. 3, Fall 2005; Thomas Buchmueller et al., "The Effect of SCHIP Expansions on Health Insurance Decisions by Employers," *Inquiry*, vol. 42 no. 3,

Fall 2005; David M. Cutler and Jonathan Gruber, "Medicaid and Private Insurance: Evidence and Implications," *Health Affairs*, vol 16 no. 1, January/February 1997; Lisa Dubay and Genevieve Kenney, "Did Medicaid Expansions for Pregnant Women Crowd Out Private Coverage?" *Health Affairs*, vol. 16 no. 1, January/February 1997.

[12] These study findings are summarized in Minnesota Department of Health, Health Economics Program, "Health Care Coverage and Financing in Minnesota: Public Sector Programs," January 2003, p. 16.

[13] Minnesota Department of Health, Health Economics Program and University of Minnesota School of Public Health, "Health Insurance Coverage in Minnesota: Trends From 2001 to 2004," February 2006.

[14] A 1997 study by researchers at the Urban Institute found that as the share of an enrollee's income paid in premiums rises, take-up of subsidized insurance declines. With premiums lower than 1% of income, participation was around 57% of eligible people; with premiums at 5% of income, participation was only 18% of eligible people. Leighton Ku and Theresa Coughlin, "The Use of Sliding Scale Premiums in Subsidized Insurance Programs," Urban Institute, April 1997.

[15] Office of the Legislative Auditor, "MinnesotaCare," January 2003.

[16] U.S. Bureau of the Census, Current Population Survey, various years.

[17] Minnesota Department of Health and University of Minnesota School of Public Health.

[18] Lisa Dubay, John Holahan, and Allison Cook, "The Uninsured and the Affordability of Health Coverage," *Health Affairs* web exclusive, November 30, 2006.

[19] Kaiser Family Foundation and Health Research and Educational Trust, "Employer Health Benefits 2006 Annual Survey," September 2006.

Rural Minnesota's Health Care Workforce: Demographics, Geography & Strategies

J.H. Fonkert

A skilled rural healthcare workforce is important not only to make quality health care accessible to people in rural areas, but also because the professionals who work in rural clinics, hospitals and other healthcare settings pump millions of dollars into local economies.

This article highlights the importance of the healthcare workforce for local economies, describes the demographics and geography of Minnesota's rural healthcare workforce, summarizes current strategies to assure an adequate supply of healthcare providers in rural areas, and explores some rural healthcare workforce planning issues.

Most workforce data presented here comes from surveys of licensed professionals conducted by the Office of Rural Health and Primary Care in the Minnesota Department of Health. The complete data is available at: http://www.health.state.mn.us/divs/chs/workforce/data.htm.

This article uses federal definitions for metropolitan and rural areas. Metropolitan areas are comprised of counties surrounding core cities of at least 50,000 population. Minnesota has 21 counties in six metropolitan areas (Minneapolis-St. Paul, Duluth-Superior, St. Cloud, Rochester, Fargo-Moorhead and Grand Forks-East Grand Forks). Micropolitan areas include one or more counties surrounding cities of at least 10,000 population. Minnesota has 20 counties in 18 micropolitan areas. For purposes of this article, the other 46 counties are considered rural.

Workforce is Both a Health and an Economic Issue

The importance of doctors, physicians, nurses and other healthcare professionals for good health outcomes is obvious. But healthcare is also an economic development issue for rural areas.

When patients must go elsewhere for care, dollars and jobs go with them.

One of every eight Minnesota private-sector jobs is in healthcare.[1] The healthcare industry accounts for more than 20% of jobs in some rural counties. In all, more than 210,000 Minnesotans work in a wide variety of healthcare occupations. Physicians, nurses and dentists are the largest and perhaps most visible occupations, but health care centers employ a wide variety of occupations based in medicine, the biological sciences and health technology (see Figure 1).

Age and Gender

As the overall population ages, many professions face the challenge of replacing retiring workers. The workforce in some healthcare occupations is still relatively young, but a large share of the dentist, physician and nursing workforce is near retirement.

Many healthcare occupations continue to be male or female dominated. Most physicians and dentists are male, but female numbers are rising rapidly in these fields. At the same time, nursing and some allied health occupations continue to be filled mostly by females. The rural health workforce is even less gender-balanced than the rest of the state, with fewer female physicians and dentists and very few male nurses in rural areas.

Physicians. In 2005, 28% of active physicians were 55 or older. The median age of 48 was similar across metropolitan, micropolitan and rural counties. Physicians in micropolitan areas are actually a bit

Figure 1: *Examples of Minnesota health occupations.*

3,500	Physical therapists
600	Recreational therapists
3,200	Medical and clinical laboratory technologists
3,170	Medical and clinical laboratory technicians
3,000	Dental hygienists
3,470	Radiologic technologists and technicians
4,000	EMTs and paramedics
3,700	Medical records and health information technicians
800	Diagnostic medical sonographers
5,800	Pharmacy technicians
750	Cardiovascular technologists and technicians

Source: U.S. Bureau of Labor Statistics, May 2005 employment data, revised May 2006.

older than physicians in either metropolitan or rural areas. A smaller proportion of micropolitan physicians are under 35, and a larger proportion is over 55 than in other parts of the state.

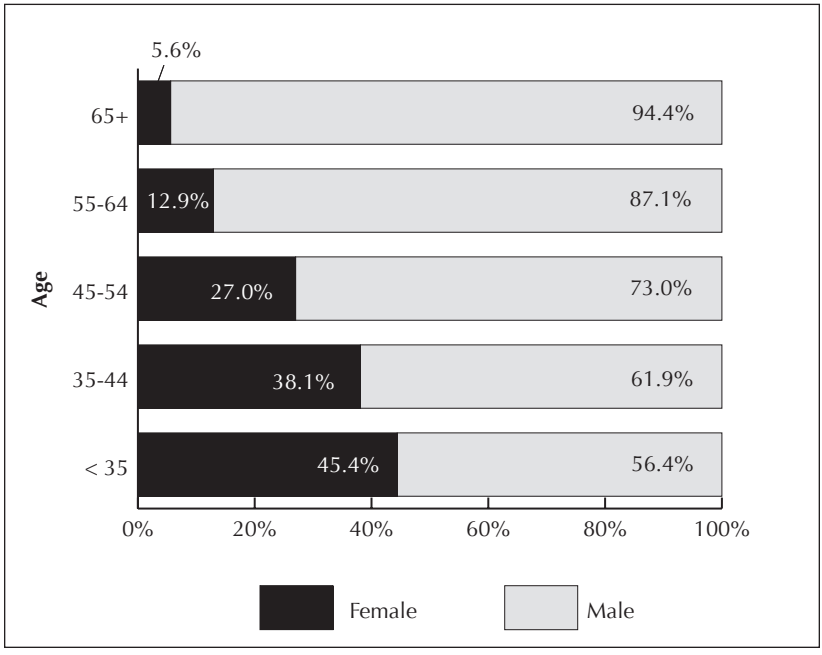
In Minnesota, 28% of physicians are female, up from 21% a decade earlier. The overall gender percentages, however, obscure a large difference between older and younger physicians. Only 11% percent of practicing physicians 55 or over are female, compared to 40% percent of physicians under 45. In 2005, women accounted for 47% percent of all first-year Minnesota medical students (including Mayo).

Women are a bit less likely to practice in rural areas than urban areas. While 28% of metropolitan area physicians are female, only 24% of rural physicians and 22% of micropolitan physicians are female (Figure 2).

Physician assistants. Physician assistants are considerably younger than physicians, reflecting in part a shorter training period. The statewide median age is 41, but the median age in rural counties is 44. In 2005, 35% of metropolitan physician assistants were under 35, compared to 20% of rural PAs.

Women make up 58% of all Minnesota physician assistants. The gender of physician assistants does not differ much between

Figure 2: *Physician gender by age.*



urban and rural areas; 61% of rural physician assistants are women. Younger physician assistants are more likely to be female, with women accounting for 73% of PAs under the age of 35.

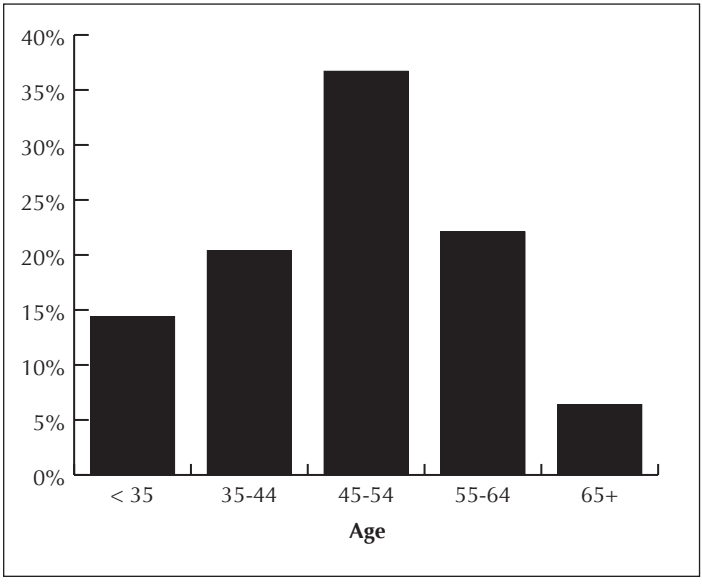
Nurses. Although they take less time than physicians to train, the nursing workforce is about the same age as the physician workforce. The statewide median age of registered nurses is 47, but reaches 49 in rural counties. Twenty-nine percent of rural RNs were 55 or older in 2005, while only 14% were under 35 (Figure 3).

The licensed practical nurse workforce is about the same age as the RN workforce. Their median age in rural areas is 48, matching the statewide median. While 28% of LPNs were 55 or older in 2005, 18% were under 35.

More than 93% of all registered nurses and 97% of all licensed practical nurses are female. Male nurses are even less common in rural areas than in urban areas.

Respiratory care practitioners. The median age of respiratory care practitioners is 44. Micropolitan and rural RCPs are probably older than RCPs in metropolitan counties, but the small number of RCPs outside metropolitan counties makes the data less reliable. Statewide, 12% of RCPS were 55 or older in 2005.

Figure 3: *Rural nurses by age.*



More than six out of 10 respiratory care practitioners are women. The gender mix differs only slightly between urban and rural areas. However, only several dozen RCPs practice in the state's most rural counties. The female majority in the profession may be growing, because 71% of RCPs under age 35 are women.

Physical therapists. Physical therapists are relatively young, with a statewide median age of 42. Rural therapists are even younger with a median age of 39. Only 9% of rural physical therapists were 55 or older in 2005, while 39% were under 35. This may reflect growth of the profession in rural areas after it became established in more urban areas.

More than three-quarters of practicing physical therapists are women. Male therapists are somewhat more common in rural counties, where only 68 percent are female, but women still dominate the field at all age levels.

Dentists. Dentists have the oldest median age, 49 years, of the major health care providers. Rural dentists are even older, with a median age of 53 in 2005. Fewer than one in four rural dentists were under 45, while 38% were 55 or older.

Four of five dentists practicing in Minnesota are male. Female dentists are even less common in rural areas, where 89% of rural dentists are male. Dentistry has lagged behind medicine in its recruitment of women, but gender balance is improving in dentistry as it is in medicine, with females now accounting for 42% of dentists under age 35.

Dental assistants and hygienists. Statewide, dental assistants had a median age of 37 and hygienists had a median age of 42. Rural dental assistants are older than urban assistants, but rural hygienists are younger than their urban counterparts. Only 8% of dental assistants and 6% of rural hygienists were 55 or older. One third, 33%, of hygienists and 30% of assistants were under 35.

Dental hygienists and assistants are the most female-dominated health care occupations in Minnesota, with more than 99% of hygienists and assistants being female.

Geography

Physicians and other health care providers are not evenly distributed across the state but are disproportionately concentrated in urban centers with major hospitals and clinics. One measure of physician supply is the number of physicians per 100,000 population.

ORHPC estimates that about 12,800 physicians worked at least part time at a Minnesota practice site in 2005, amounting to 246 physicians per 100,000 Minnesotans.

Most active physicians, 85%, had primary practice sites in metropolitan counties in 2005. Another 10% practiced in micropolitan counties and only 5% in the state's 46 most rural counties (Figure 4).

An alternative geographical breakdown of the state gives a different picture of how physicians are distributed across Minnesota.

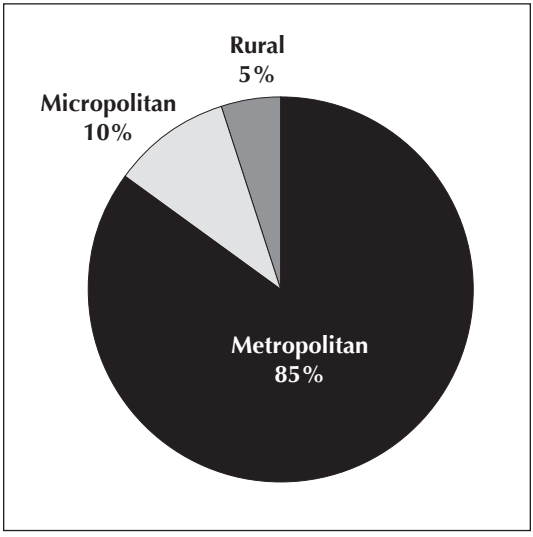
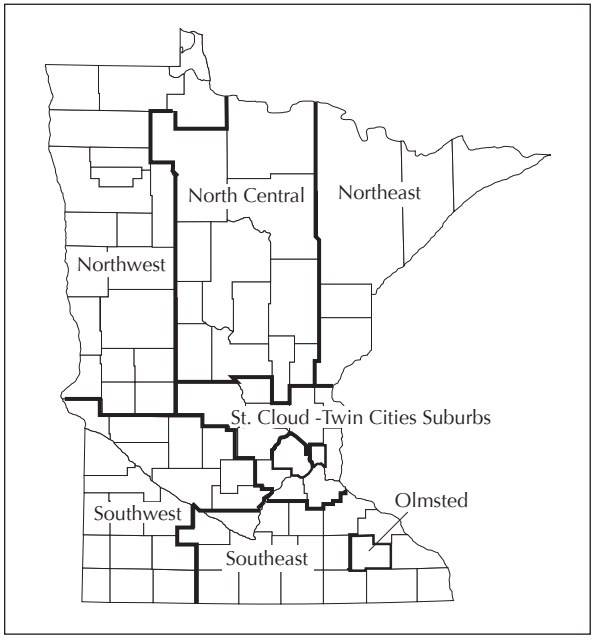


Figure 4: *Geographic distribution of Minnesota physicians, 2005.*

Table 1: *Physicians per 100,000 population, estimated, by region.*

	Physicians	Physician Assistants	RNs	LPNs	Dentists
Hennepin/Ramsey	348	15	1,358	241	73
Twin Cities Suburbs/ St. Cloud	133	9	523	194	49
Olmsted County	1,551	71	3,848	561	86
Southern Minnesota	137	12	634	448	50
Southwest Minnesota	121	8	755	514	46
Northwest Minnesota	103	15	645	525	44
North central Minnesota	149	9	787	470	44
Northeast Minnesota	279	11	1,152	481	61

Figure 5: *Minnesota regions.*



This regional approach first breaks out the Hennepin-Ramsey county core of the Twin Cities and Olmsted County (Rochester), then divides the rest of the state into five contiguous geographic regions.

More than 60% of physicians practiced in Hennepin, Ramsey and Olmsted counties in 2005. Olmsted County had more than 1,500 physicians per 100,000 population, while Hennepin and Ramsey together had nearly 350 physicians per 100,000 population. Patients in these counties appear to have an unusually large number of physicians to choose from, but as major medical centers, Minneapolis-St. Paul and Rochester also serve many patients from other parts of the state and nation.

The balance of the state had 143 physicians per 100,000 population. As shown above, rural areas have far fewer physicians per capita than urban areas, but broad geographic regions of the state have roughly similar numbers of physicians. After Hennepin, Ramsey and Olmsted counties are excluded, the number of physicians per capita does not vary widely among regions of the state. The one exception is northeast Minnesota, which has about 280 physicians per 100,000 population, compared to between 100 and 150 in other regions (Table 1).

Table 2: *Physician specialties by metropolitan, micropolitan and rural counties.*

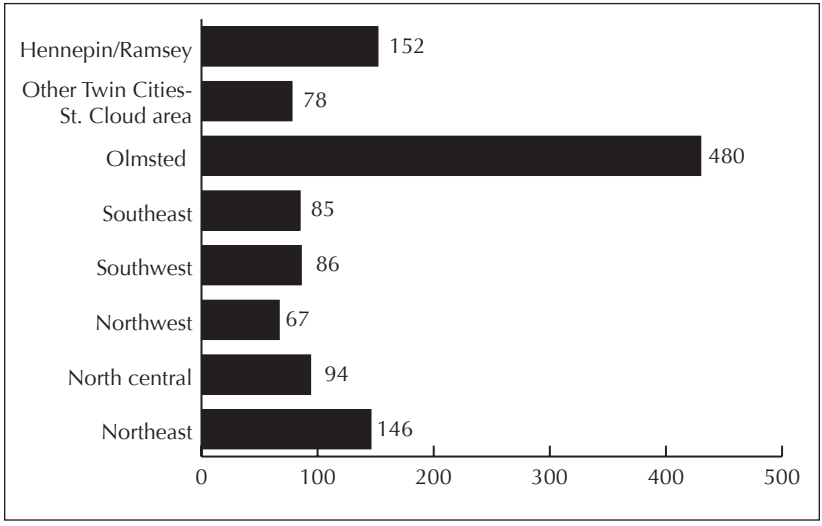
	% in primary care	Physicians per 100,000 population (estimated)		
		Primary care	Surgical specialties	Other specialties
Metropolitan statistical area counties (n = 20)	44%	129	28	136
Micropolitan statistical area counties (n = 21)	57%	98	19	55
Rural counties (all other) (n = 46)	78%	75	8	13

Primary care and specialists. The first concern in health care access is the availability of primary care physicians. Primary care physicians include family practitioners, internal medicine physicians, pediatricians, obstetricians and gynecologists. While primary care physicians may be more specialized than general practitioners once were, they remain the first point of physician contact for most people. Primary care physicians deal with the most common medical problems and are the first step before specialized care.

Table 3: *Physician specialties by region.*

	% in primary care	Physicians per 100,000 population (estimated)		
		Primary care	Surgical specialties	Other specialties
Hennepin and Ramsey counties	44%	152	33	163
Remainder of Twin Cities and St. Cloud Metropolitan Areas	58%	78	11	44
Olmsted County	28%	430	139	986
Southeast Minnesota (excluding Olmsted Co.)	62%	85	14	39
Southwest Minnesota	71%	86	7	28
Northwest Minnesota	65%	67	13	24
North central Minnesota	64%	94	17	37
Northeast Minnesota	52%	146	32	101

Figure 6: *Primary care physicians per 100,000 population, estimated, by region.*



Of physicians practicing in Minnesota, 49% claim a primary care discipline as their principal specialty. Another 11% are surgical specialists and 40% practice in other specialties.

While it may be necessary to travel some distance to see a specialist, there is an expectation that Minnesotans will find primary care physicians reasonably close to home. To achieve this goal, primary care physicians need to be distributed fairly evenly across the state.

The good news for rural areas is that 78% of rural physicians practice in a primary care specialty. The bad news is that rural areas have few specialists. An estimated 84% of surgical specialists practice in metropolitan counties, while only 4% practice in the state's 46 most rural counties. Of non-surgical specialists, 91% practice in metropolitan counties, and only 2% in rural counties. Primary care specialists account for 44% of practitioners in metropolitan counties and 57% of practitioners in micropolitan counties (Table 2).

The disparities are not surprising. Just as smaller communities are less likely to have other kinds of specialized professional services, they are less likely to have large numbers of physicians and may have few, if any, specialists.

The smaller number of physicians in rural counties means patients are more likely to need to travel to the nearest larger community to see a physician. The critical question then becomes, how far is the patient willing or able to travel? The answer depends

on the distance to a larger center that has the needed health care services. This question is even more important in some parts of the state than others: a look at a map shows that distances are generally shorter in southern Minnesota and longer in northern Minnesota, where sizable communities are more widely spaced.

The following highlights summarize how the physician workforce is distributed across the state.

- Because of its unique cluster of international-class medical facilities, Olmsted County has an unusually large number of physicians per 100,000 people, and an extraordinary number of non-primary care specialists. Only 28% of Olmsted County physicians are in primary care specialties.
- Hennepin and Ramsey counties are home to major medical facilities that serve patients from across the metropolitan region and the state. More than half of physicians in Hennepin and Ramsey counties are non-primary care specialists.
- The per-capita number of physicians in the remainder of the Minneapolis-St. Paul and St. Cloud metropolitan areas is not unusual compared to other regions of the state. This urban and suburban region actually has slightly fewer primary care and surgical specialty physicians than Greater Minnesota regions but has an edge in the number of non-surgical specialists.
- The largely rural northeast, north central, southwest and southeast regions actually have more primary care physicians per capita than the counties surrounding Minneapolis and St. Paul.
- The northeast region is a special case. Physicians, especially specialists, in this region are heavily concentrated in the city of Duluth (St. Louis County), a major medical center for the region. If St. Louis County is excluded, the number of primary care physicians in Cook, Lake, Kanabec and Carlton counties drops to 96 per 100,000 people, more in line with other regions of the state. The figure for St. Louis County alone is 166.
- The most physician-poor region is the northwest, with only 67 primary care physicians per 100,000 people. This low number may partially reflect patients traveling to clinics in the nearby regional centers of Fargo and Grand Forks in North Dakota.

The northwest regional data suggests another important point. Any analysis of this kind is based on arbitrary geographical boundaries which people may think nothing of crossing for health care. If the data permitted an answer, the critical question would be: Where does access to health care suffer because people live too far from the physicians they need to see? A community's small size alone does not put it at risk, but distance from care does. Lack of larger urban centers and remoteness combine most dramatically in large areas of northern Minnesota, but it is also an issue in western Minnesota.

Physicians, especially specialists, tend to practice in or near communities with hospitals. Six Minnesota counties – Cass, Clay, Dodge, Fillmore, Houston and Red Lake – do not have any hospitals. The greatest distances between hospitals are in the northern half of the state. The Critical Access Hospital program and health professional shortage area designations both recognize the importance of distance to care. To qualify for critical access status, a hospital must be 35 miles from another hospital or 15 miles in an area with only secondary roads. If two hospitals are 35 miles apart, a patient living half way between them would have two hospital choices within 18 miles.

Dentists

Dental care differs from medical care in important ways. First, a much smaller percentage of Minnesotans have dental insurance coverage, and a higher proportion of dental care expenses are paid from private out-of-pocket sources.[2] Second, dentists are more likely to work in small offices and clinics.

However, the geographical distribution of dentists is similar to that of physicians, with more dentists per capita in urban areas than in rural areas. In 2005, 78% of dentists had a primary practice site in one of the state's 20 metropolitan area counties, while only 8% practiced in the state's 46 rural counties.

Table 4: *Dentists per 100,000 population by metropolitan, micropolitan and rural counties, 2005.*

	Per 100,000 population (estimated)
Metropolitan statistical area counties (n = 20)	64
Micropolitan statistical area counties (n = 21)	55
Rural counties (all other) (n = 46)	36

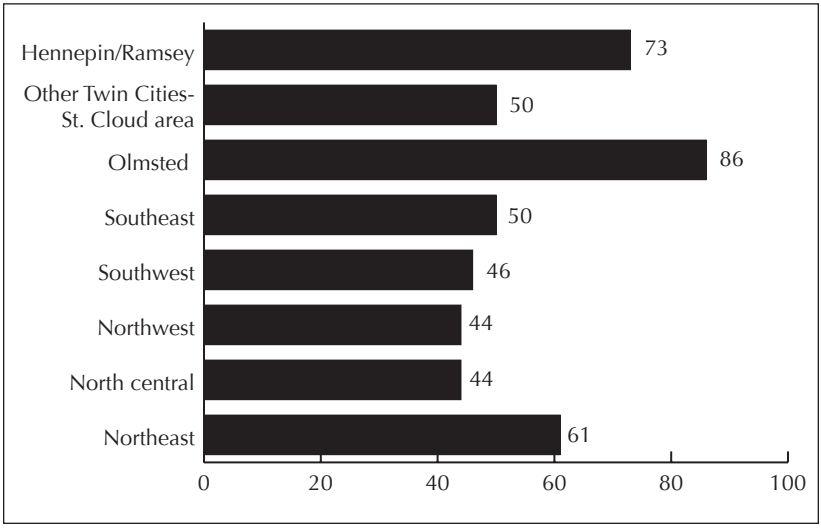
Metropolitan area counties had nearly twice as many active dentists per capita (64 per 100,000 population) as rural counties (36 per 100,000). Micropolitan area counties, with 55 dentists per 100,000 population, were closer to the metropolitan standard.

As with physicians, the regional approach gives a different picture of the distribution of dentists. First, it shows the concentration of dental practices in Hennepin, Ramsey and Olmsted counties. Hennepin and Ramsey counties had 73 dentists per 100,000 population compared to 50 in the eleven surrounding counties comprising the balance of the Minneapolis-St. Paul and St. Cloud metropolitan areas.

The southeast, southwest, northwest and north central regions all had between 44 and 50 dentists per 100,000 population. Five counties in northeastern Minnesota had 61 dentists per 100,000, but these were disproportionately located in St. Louis County, especially in Duluth. The remaining four northeastern counties had an estimated 44 dentists per 100,000 population.

This analysis shows that, outside Minneapolis-St. Paul, Rochester and Duluth, dentists are fairly evenly distributed across the state's major regions. However, the metropolitan-micropolitan-rural analysis above suggests that in each of these regions, dental practices tend to be concentrated in more urban counties that are part of metropolitan and micropolitan areas.

Figure 7: *Dentists per 100,000 population, estimated, by region, 2005.*



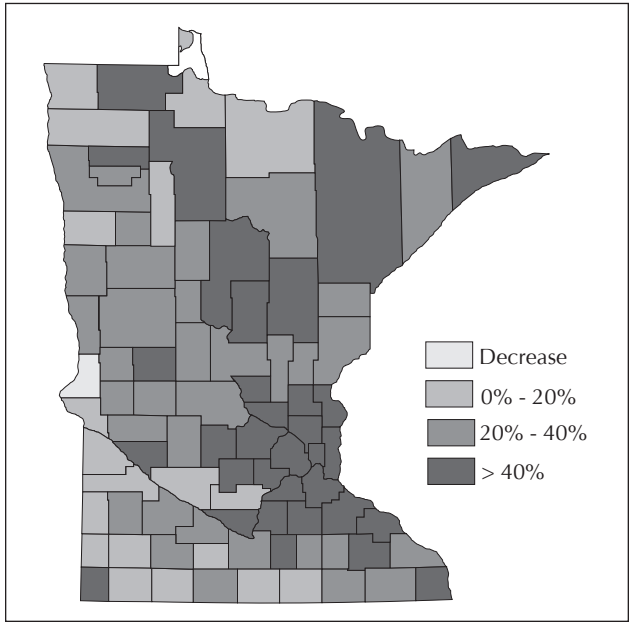
Aging Population

Not only is today's healthcare workforce aging, tomorrow's workforce will be serving an older population with different needs. The state demographer projects that Minnesota will have nearly 78,000 more people over 85 in 2030 than in 2000. We are used to associating high percentages of elderly with rural areas, but the largest increases in senior population will be in suburban and other parts of the state where populations grew rapidly over the past 30 years.

An older population makes different demands on the health care workforce. Older adults suffer more chronic illnesses, use more prescription medicine, and have more difficulty with daily activities and mobility.[3] In part due to the aging population, the Association of American Medical Colleges recommends a 30% increase in medical school enrollments between 2006 and 2015 to alleviate an expected physician shortage.[4] Health workforce demands will vary by occupation,[5] but may be especially strong for occupations such as licensed practical nurses, who often work in long-term care settings.

The greatest increase in demand for healthcare workers to serve older people will not be in rural, but in suburban and lake-country Minnesota. This is not good news for rural areas. Rather, rural areas

Figure 8: *Projected percent change in population age 65-75 by county, 2005-2015.*



that already have trouble recruiting physicians and other healthcare professionals will be competing more than ever against suburban and other recent high-growth areas. If an older population does, in fact, generate increased demand for healthcare, it can be assumed that wage levels will rise as health care provider organizations try to secure the labor they need. The question for rural areas is whether they will be able to compete in a statewide market for labor.

Targeting Resources to Shortage Areas

Medical technology has advanced by leaps and bounds, but healthcare remains a labor-intensive industry. Diagnosis and treatment of people takes time, and physicians, dentists and other frontline healthcare professionals can serve only a limited number of patients a day. Practitioner shortages can increase patient wait times, hurt quality of care, and drive up wages, adding to health care cost pressures.

Several federal and state programs provide funds to increase the number of practitioners in shortage or high-need areas.

Health professionals shortage areas. Based on the ratio of population to primary care physicians, the federal government has designated parts of 30 Minnesota counties – mostly in the western and northern parts of the state – as health professional shortage areas (HPSAs). All or part of 27 counties also qualify as shortage areas based on low income.

Designation of a HPSA is more than an academic exercise. Several federal and state programs target assistance to HPSA area facilities or to providers who make a commitment to practice in a HPSA. Geographic HPSAs are based on the concept of a "rational area" for delivery of primary medical care services. A rational area can be one or more counties whose population centers are within 30 minutes travel time of each other.

A rational area qualifies as a HPSA if it has more than 3,500 people per primary care physician. An area with more than 3,000 people per primary care physician qualifies if it has "unusually high needs for primary care services or insufficient capacity of existing primary care providers."

Medically underserved areas. All or parts of 55 counties and large areas of Minneapolis and St. Paul are designated as medically underserved. Parts of eight counties are designated underserved based on low-income.

As with HPSA determinations, medically underserved areas are based on service areas comprising all or parts of one or more

counties with population centers within 30 minutes' travel time of each other. Service areas are scored based on percent of population below poverty, percent of population over 65, infant mortality rate and the per-capita number of primary care physicians. The lowest scoring (and thus most underserved) service area in Minnesota is a sparsely populated area of western Koochiching and northern Itasca counties. The nearest significant service centers are International Falls to the east and Grand Rapids to the south.

Minnesota Strategies

Initiatives to meet rural health workforce challenges involve government, private industry and professional associations and focus on two broad strategies: 1) attracting young people to healthcare careers and 2) encouraging healthcare professionals to work and stay in rural areas. A basic premise in these efforts is that young adults from rural areas, or students who have had positive rural experiences as part of their training, are most likely to take jobs in rural areas.

Recruiting students. Recruitment of students to healthcare begins in high school or before. One effort, an alliance of healthcare employers, higher education institutions and government, co-sponsors a Minnesota chapter of Health Occupations Students of America (HOSA), which has more than 800 student members. The Minnesota departments of Health, Education, and Employment and Economic Development all promote health career education in secondary schools. Together with higher education and private industry, they sponsor an annual conference for secondary school health careers teachers. The Department of Health also makes grants to local educational consortia to support health careers curricula. The grants are targeted to rural areas and long-term care.

Financial incentives. The state also uses financial incentives to encourage health care professionals to begin their careers in rural or underserved areas. Loan repayment grant programs encourage primary care medical, mid-level practitioner and pharmacy students to practice in rural areas. For these programs, state law defines rural to include all areas outside the seven-county Twin Cities area, with the exceptions of the cities of Moorhead, Mankato, St. Cloud, Duluth and Rochester. A separate loan repayment program offers up to $40,000 over two years to a wide range of medical, dental, mental health and social work professionals who are practicing at sites in either rural or urban health professional shortage areas.

The state also offers loan repayment grants to nursing and dental students, but these programs are not restricted to rural areas. Grants are made to nursing students who commit to practicing in nursing homes and ICF/MRs. Dentists must agree to serve state public program enrollees or patients receiving sliding fee discounts.

Higher education programs. The University of Minnesota Medical School and Dental School both promote rural practice. The University admits 55 students each year to its Duluth program, where they study for two years before transferring to the Twin Cities to complete their degrees. More than half of graduates who enter through the Duluth program go on to family practice residencies.

The School of Dentistry rotates students through two-week practicums at a clinic in Hibbing that serves mostly underserved families from northeastern Minnesota. The clinic is a joint venture of the University and Hibbing Community College. The University is in negotiations to open a similar clinic in Willmar.

The University's College of Pharmacy opened a Duluth program in 2003, with a special emphasis on pharmacy practice in non-metropolitan areas. This year, first-year Duluth pharmacy students joined Duluth medical students in a 20-hour primary care medicine course in Grand Rapids and surrounding communities.

Many Minnesota State Colleges and Universities institutions train nurses, clinical laboratory professionals and other health care workers. Healthcare workforce issues are the focus of The Minnesota Healthcare Education Industry Partnership, a collaboration among MNSCU, the healthcare industry and government. An HEIP taskforce has worked on initiatives to increase the supply of clinical laboratory workers and established a Career and Technical Education Teacher Induction Program to support first-year secondary health careers teachers.

Recruiting to rural areas. The Minnesota Dental Association has made a strong push to promote rural dental practice over the past two years. The MDA is concerned about the large number of rural dentists near retirement age and the ability of small communities to find replacements, so the MDA is encouraging communities to create local task forces to promote themselves to prospective dentists and other healthcare professionals. The association emphasizes the economic contribution a dental practice can make to a community. A solo-dentist practice typically employs two dental assistants, a dental hygienist and a receptionist. The chair of MDA's rural dentistry task force estimates, however, that a dentist needs 1,800 to 2,000 patients to be economically viable.

Other programs indirectly address rural health workforce needs by strengthening rural hospitals and clinics, possibly making them more attractive practice sites for physicians and other health professionals. These include quality improvement grants to small hospitals and clinics for planning, quality improvement projects and improved infrastructure and equipment.

Some communities have turned to foreign healthcare professionals to meet shortages. Nationally, only 41% of family medicine and 56% of internal medicine residency positions were filled by U.S.-educated physicians in 2006.[6] Non-citizens study under J-1 visas, but require waivers to stay and work in the United States. Each state was originally allotted 20 waivers, but allocations were raised to 30 in 2002. Minnesota placed 17 wavered physicians in 2006. Physicians with waivers must work three years in a shortage or underserved area. Northwest and southwest Minnesota have been the heaviest users of J-1 physicians.

Workforce Planning Issues

Two questions at the heart of health care in Minnesota are: Does rural Minnesota have enough health care? And, how much is enough?

The answers are not obvious. Rural areas do have fewer physicians, fewer medical specialists and fewer dentists than urban areas, and rural communities compete aggressively for providers.

An adequate healthcare workforce is important to rural Minnesota in two ways. First, without enough primary care physicians, dentists and other providers, people must wait longer or drive farther for basic care. Second, a diversified mix of providers, including specialists, strengthens clinics and hospitals and increases their positive economic impact on rural communities.

The economic and geographic circumstances of rural areas make health care there different from health care in urban areas. Just as urban areas have more specialty and upscale stores, urban areas also have more specialized and "high-end" medical services. The challenge in rural areas is not to duplicate the urban market, but rather to ensure that the health care available to rural citizens is of high quality and adequate to serve their needs.

From a health perspective, the first concern is primary care. However, specialists are important to the economic viability of rural hospitals because they attract patients and generate income. For example, the hospital in a mid-sized trade center in southwestern Minnesota finished its last fiscal year with a net loss, partly due to a decline in income after it lost two orthopedic surgeons. The facility

is a Critical Access Hospital, which is limited to 25 beds, but because many surgical procedures are now done with no or short hospital stays, having a specialist on staff can increase a hospital's income, while allowing it to retain its CAH status.[7]

Two basic characteristics of rural areas make their health care markets different: smaller population base and distance from larger, more urban centers. Size and remoteness matter. Smaller markets mean fewer providers. Remoteness means farther to travel to have any choice of providers. Just as a minimum population base is required to support a movie theater or a bookstore, an adequate number of paying "customers" is needed to support a dental practice, a pharmacy or a surgery center.

Physicians, dentists and other health care practitioners working in small rural communities may earn less, be employed by financially vulnerable healthcare organizations, be farther from specialists or full-service hospitals, and have less access to advanced technologies.

For all these reasons, the smallest communities in the most remote locations may have trouble attracting the healthcare providers they need. The best healthcare is expensive. Two critical questions for rural healthcare planners are:

- Will the healthcare financing system provide the income level necessary to support hospitals, clinics and providers in rural areas?
- What new approaches to healthcare delivery (e.g., telemedicine) will make it possible to provide either higher quality care or reduce costs?

Health care delivery will change, in part to stay affordable. Healthcare organizations will use different occupational mixes and entirely new occupations to increase quality and control costs. Past examples of change include the emergence of physician assistants, nurse anesthetists and minute clinics.

Healthcare workforce will continue to be a vital issue for rural residents, healthcare employers and their communities. Rural citizens need enough practitioners to assure timely, quality care. Hospitals and clinics need to be able to hire enough employees at salary levels they can afford. Rural communities will always compete in a larger market for workers. But industry, communities and government can work together to ensure quality access to healthcare for all Minnesotans.

Endnotes

[1] U.S. Department of Commerce, *County Business Patterns, 2004*. Excludes railroad workers and self-employed.
[2] Association of State and Territorial Dental Directors, *Guidelines for State and Territorial Oral Health Programs*, September 2006, pp. 8-9.
[3] An overview of relationships between age and healthcare demand is found in *The Impact of the Aging Population on the Health Workforce in the United States*, pp. 10-13 (prepared by The Center for Health Workforce Studies, University of New York at Albany, for the Bureau of Health Professions, Health Resources and Services Administration, December, 2005).
[4] Association of American Medical Colleges, *AAMC Statement on the Physician Workforce*, June, 2006.
[5] *Ibid*., pp. 14-17.
[6] National Resident Matching Program, "Advanced Data Tables for 2006 Main Residency Match," March 16, 2006, retrieved from www.nrmp.org.
[7] Rae Kruger, "Return of orthopedic surgeon would be a boost for Avera," Marshall (MN) *Independent*, August 23, 2006, p. 9A.

Telehealth in Minnesota: At a Crossroads

Karen Welle & Stuart Speedie

This is a heady time for those who are taking advantage of health information and telecommunications technologies to provide affordable, safe and high quality health care. New acronyms and terms are popping up every day to deal with the growing use of technology to deliver health care. "Telemedicine" (provision of clinical services over distance), "telehealth" (a broader application including distance education, consumer outreach, etc.), "HIT" (Health Information Technology), "ICT" (Information and Communications Technology"), "EHR" (electronic health record), and "HIE" (health information exchange) are just a few. If those involved in the health care delivery system struggle to keep pace with new acronyms and terms, imagine the difficulty faced by consumers.

While various efforts have been under way for years to connect health care providers to each other and to their distant patients, several factors are now coming together to create a broad interest in pushing the agenda on the use of health information technology to exchange information and deliver health care in new ways. A few of those factors include: concern over patient safety and quality health care delivery, rapid deployment and use of broadband and wireless technologies, dismay over rising health care costs, and pressing health worker shortages experienced by many rural communities.

Rural communities see the benefits

Rural communities stand to gain from advances in health information and communications technologies. Telemedicine and telehealth activities began to appear in communities and regions across Minnesota more than a decade ago as an effective and efficient way to overcome the challenges of long distances and a shortage of specialty care providers. The benefits are numerous. Patients remain

with their families and in their communities. Travel time and costs are reduced or eliminated. Employers experience fewer lost work hours. Rural primary care practitioners receive support from their colleagues in larger metropolitan areas. Patients report a high level of satisfaction, and most importantly, medical outcomes are better as patients have access to needed services.

Telehealth has been used very effectively in a variety of settings:

- Specialty consultations between primary care physicians in rural communities and specialists in larger urban hospitals and clinics support practitioners and save patients from traveling long distances to see specialists.
- Videoconferencing connections over secure networks link patients directly to providers in separate locations. Telemental health and telepsychiatry are among the growing areas for this application.
- Teleradiology allows digital X-ray images to be instantly conveyed to a radiologist in a remote location for interpretation.
- Home telehealth connects patients in their homes to providers via a variety of simple technologies including web cams and monitoring devices that transmit blood pressure, heart rate, and other health indicators to a nurse in a clinic office.
- Distance learning for K-12 and college students in health care fields, medical professional trainees, and healthcare staff permits students to be educated and receive continuing education and advanced training in their own communities.
- Telepharmacy connections allow 24/7 pharmacy coverage in small-town hospitals and the development of remote retail outlets staffed by pharmacy technicians or nurses under the supervision of a pharmacist.

Telehealth and health information technology: mutual benefits

Today, the federal government has taken on the task of accelerating the development of electronic health records exchange. In January 2004, President Bush called for the widespread adoption of electronic health records within 10 years. An Office of the National Coordinator for Health Information Technology was established in the Department of Health and Human Services. Secretary Mike Leavitt's stated vision is "to link all health records through an interoperable system that protects privacy as it connects patients,

providers and payers, resulting in fewer medical mistakes, less hassle, lower costs and better health."

The new emphasis on the adoption of electronic health records clearly has widespread implications for patient safety and quality of care, privacy, public health, consumer involvement in health care decisions, and cost containment. But it is also creating an environment for the support and growth of telehealth services. The goals and activities of telehealth and electronic health records exchange are complementary and synergistic. The same infrastructure and systems that support the development of electronic health records and exchange of health information can also support the delivery of health care via telemedicine and vice versa.

Minnesota e-Health Initiative

There has never been a better time for the expansion and coordination of telehealth and telemedicine in Minnesota. In addition to the federal government's commitment to health information technology expansion and significant private sector investment, Minnesota has initiatives in place that will move development and coordination of telemedicine activities forward in significant ways. The first of those initiatives is the recent development of statewide activities to expand electronic health records.

The Minnesota e-Health Initiative is the result of legislation directing the Minnesota Department of Health to lead the coordination and development of electronic health records in Minnesota. In September 2004, a public/private advisory committee was convened, comprised of representatives of hospitals, health plans, physicians, nurses, other healthcare providers, academic institutions, state government purchasers, local and state public health agencies, citizens, and others with expertise in health information technology and electronic health records systems.

Meeting over the course of approximately eight months, the e-Health Advisory Committee came up with fourteen recommendations for priority action to be included in a report to the 2007 Minnesota Legislature. While the focus of those recommendations — to empower consumers, inform and connect health care providers, protect communities, and enhance the infrastructure — center around electronic health records development, they emphasize that rural and underserved communities must not be left out of the development of a health information exchange system. In fact, one of the Initiative's recommendations points directly at the necessity of ensuring that e-Health system development is integrated with and supports

statewide telehealth services, with the goal that by 2012 all Minnesotans will have access to reliable, secure, and robust telehealth services that are fully integrated with e-Health systems. To learn more about the e-Health Initiative, go to: http://www.health.state.mn.us/e-health/

Planning for the telehealth future

Telehealth must be included in any infrastructure and system development planning so that the resulting system evolves in a way that supports telemedicine services. To do otherwise would be a missed opportunity for rural communities.

Common requirements for both telehealth and health information exchange networks include:

- **Establishing and maintaining networked relationships.** Telehealth networks, which often consist of one or more hospitals and multiple affiliated clinics, require multiple independent organizations to work together toward a common goal of providing health care, keeping in mind established patient referral patterns and provider relationships. They need to be built with a critical understanding of the existing political and economic structure of the health care system in the region served in order to fully realize the benefits of remote clinical services.
- **Overcoming resistance within the organization.** Change is difficult, even positive change. Champions for developing remote health and medical services often come from organizations or departments with different needs and expectations. New alliances between leaders from HIT, clinical medicine, telecommunications and public health are needed to overcome resistance to change.
- **Surmounting the absence of standards and guidelines.** Standards have been a long-standing issue in telemedicine. Advocates for the development of telemedicine have wrestled with incompatible software and devices using proprietary specifications combined with a lack of agreed-upon protocols, guidelines and business strategies. With the growing maturity and size of the videoconferencing market and the new government emphasis on implementing HIT, collaboration should focus on mutually agreed-upon technical benchmarks and high quality communications networks that assure interoperability on several levels and that allow health

professionals providing distant care to have immediate access to a patient's health history.

- **Financial sustainability.** Sustainability of a telehealth system is dependent upon adequate revenues and cost savings. Insurance or third-party coverage of telehealth services, while significantly improved from ten years ago, is still not at the level needed to support a self-sustaining business model. It is clear that multiple solutions are needed and that collaboration is key.

  Some telehealth networks have developed a membership model, wherein all participating facilities pay an administrative fee to cover infrastructure-related costs. Other models build upon providing off-hours emergency room support or scarce psychiatric services, where the benefits and proven cost savings justify the initial infrastructure costs.

  The Universal Service Administrative Company (USAC) administers the Federal Communications Commission's (FCC) Universal Services Fund and through its subsidy program helps keep telecommunications services affordable for rural health care providers. This program will continue to be a significant factor in the growth of health information technology and telehealth services.

  In late September 2006, the FCC announced a new pilot program starting in 2007 to support state or regional telecommunications networks with the goal of expanding regional access to telehealth services and capacity. Discussions are under way among leaders in telehealth on the best way to position Minnesota to access this program. It has the potential of being a significant driver of Minnesota's telehealth network expansion.

Minnesota telehealth success stories

Rural Minnesota communities have a history of developing innovative strategies to assure patient access to high quality care. Current community and regional successes have benefited from the creativity and initiative of a few individuals determined to respond to needs for health care services that might not otherwise be available. Those individuals gathered support, networked, found resources, and kept their focus on finding ways to connect their patients to the services they needed. Some of the current efforts under way to deliver telehealth services in Minnesota include:

Minnesota Telemedicine Network (MTN). Beginning with a single connection between the University of Minnesota Medical

School and Tri-County Hospital in Wadena, the original network has grown into the MTN, which comprises 18 rural hospitals and clinics, including tribal health facilities. Over the next year it will expand to include 25 partners.

MTN meets the needs of rural Minnesotans by providing access to a range of specialty medicine consultations (dermatology, orthopedics, neurology, gastroenterology, asthma/allergy, adult psychiatry, child psychiatry, and wound care), chronic disease management, and health professional education. The network plans include continued growth into an open network of multiple telemedicine providers and users to reach a larger percentage of the state's rural underserved populations in multiple settings, including hospitals, clinics, homes and long-term care facilities.

Wilderness Health Care Coalition: telepharmacy. The current shortage of pharmacists and the demise of local retail pharmacies has placed some rural communities at risk for losing pharmacy services altogether. The Minnesota Wilderness Health Care Coalition, comprising ten northeastern Minnesota hospitals, came together to identify a solution that would assure each hospital the after-hours pharmacy coverage they required to meet accreditation requirements and to provide better care for their patients. The Wilderness project developed a telepharmacy solution to do just that. Working in collaboration with St. Luke's Hospital in Duluth, they developed a system that allows a St. Luke's staff pharmacist to provide services to each hospital as needed on a 24/7 basis by supervising pharmacy technicians or nurses at the remote site. Using a combination of video cameras in each location to allow the pharmacist to verify medication orders and dosages, bedside barcode scanning devices, and remote dispensing equipment, the Coalition is able to preserve timely, cost-effective pharmacy services for its member hospitals.

University of Minnesota Medical School Duluth Center for Rural Mental Health Studies. The Center for Rural Mental Health Studies (CRMHS) at the University of Minnesota Medical School Duluth is integrating mental health into primary care settings for underserved rural populations using telemedicine. CRMHS partnered with the communities of Bigfork, Cook and Grand Marais and the Human Development Center in Duluth to develop a telemental health service delivery system.

This primary telemental health service uses a modified shared care model of service delivery. Psychologists from the medical school in Duluth work with a patient's primary care physician to

provide behavioral health services within the clinic via televideo communication. Patients receive timely, local mental health services that can be accessed without the stigma associated with entering a mental health clinic or the costs involved with travel to distant sites for consultation. Following the session(s) with the patient, CRMHS providers call the referring community physician, summarize their clinical impressions and offer treatment or further referral recommendations. This is followed up with a written communiqué for the patient's medical file. Patient satisfaction with the arrangement is reported to be very high.

Good Samaritan Health Care. Starting in 2001 with a Bush Foundation grant, and augmented with USDA assistance, four Good Samaritan home care agencies provide home telehealth services to an average of 80 to 100 clients at a time in seven southwestern Minnesota counties. Program staff have found that some elderly clients are initially afraid of using technology to communicate with their home care nurse, but they tend to adjust very quickly and, in fact, like it. The technology permits approximately five to six telehealth visits for each in-home visit. The savings of time and mileage result in a positive bottom line for the home care agencies and, most significantly, less frequent emergency room visits and hospital readmissions for their clients. Program staff are finding that clients are taking control of their health and are experiencing a better level of health than seen under traditional home health visit scenarios.

Continuing challenges

In September 2006, the Minnesota Department of Health's Office of Rural Health and Primary Care convened a group of about 30 individuals and organizations interested in promoting telehealth development in Minnesota. The group learned some basics of telehealth and heard about Minnesota's current telehealth initiatives. They also reviewed what other states are doing to organize and support telehealth development and identified the barriers and challenges that must be addressed to create an effective telehealth system. These include:

Isolated, uncoordinated efforts. While there were many excellent efforts currently under way, participants soon realized that these efforts have often been, and continue to be, isolated from each other. This lack of coordination and support has sometimes resulted in networks that do not or cannot communicate with each other

and staff that do not receive the support required to handle the challenges of using technology to deliver health care.

Referral patterns, local regulations and existing business arrangements. In addition to telecommunication network conflicts, existing health care referral patterns and provider relationships can interfere with connecting the most appropriate or available health care provider with the patient in need of care. Local physicians can be reluctant to refer their patients to telemedicine providers outside of their existing referral network or not associated with an affiliated organization. In addition, many rural hospitals require that any treating physician be credentialed at their facility, creating a potential for lengthy and expensive delays before telemedicine can be made available.

Policy and regulatory barriers. Public policies can also get in the way and must be addressed before a truly integrated telehealth network can exist. An example: removing the challenge of time and travel suddenly exposes the challenge of trying to connect providers who are licensed in one state with patients who reside in another state.

Broadband network availability — "the last mile". While broadband is becoming more available to some rural communities, telecommunications providers are not likely to make the investment in laying cable to communities that are remote and unlikely to provide the kind of financial return they would expect in the long term. This leaves communities that most need remote services out of the loop.

Equipment and user costs. While the Universal Service Fund helps to ease the higher cost of line charges telehealth providers must pay in rural areas, it does not provide support for the equipment needed to get a telehealth operation up and running. Even though equipment costs have dropped dramatically in the last decade, they are still not trivial. Providers often look to grant funding, which is sometimes available and always temporary.

Privacy and security. High-speed bandwidth is not enough to get the job done. For a patient and a provider to connect over distance, security is a must. A simple Internet connection, even a high-speed one, is not enough and in fact is an invitation for trouble. Telehealth networks, in order to assure patient confidentiality and conform to

HIPAA requirements, must operate in an environment that is secure. The balance between interoperability and security is critical.

Third-party reimbursements. Great strides have been made in recent years to overcome some of the reimbursement challenges that providers have faced as they have attempted to deliver services remotely. Live, interactive consultations between specialists and primary care physicians or patients are now largely covered at face-to-face rates. Teleradiology is widely, if not completely, covered. Minnesota Medicaid does pay for home telehealth skilled nurse visits; such visits are allowed as an "episode of care" under Medicare prospective payment regulations, but do not count as stand-alone reimbursable visits. Medicare and other payers do provide a small facilities fee to assist remote sites in covering their telemedicine operating costs, yet they do not fully reimburse the costs of providing telemedicine services. There is still work to be done.

Other states' telehealth initiatives

Minnesota's telehealth system, when compared to other states, is somewhere in the middle of the pack. While there is development in place, Minnesota has a long way to go before the state will be on par with other states that have developed organizational, technical, and operational systems as well as funding sustainability. The models are varied. Nebraska, Kentucky, Arizona, Montana, Washington, Virginia and Missouri are examples of public-private telehealth networks funded by a combination of state, federal and membership dollars. California's Center for Telemedicine and e-Health has received heavy funding from state health care foundations to establish and build its programs and infrastructure. Many of the networks originated, are housed in, and/or partner with their state's university medical center. While each state is somewhat unique in its approach, what is common to almost all of these models are public-private partnerships, common network infrastructures, training resources and technical assistance capacity, and broad applications that connect with other sectors, such as education or corrections.

What's next for Minnesota

Minnesota is poised to move forward in developing a supported, integrated, and interoperable telehealth system. Those who attended the September Minnesota telehealth forum identified steps to ensure that further development in Minnesota is coordinated and sustainable. Among them:

1. To establish a statewide public-private initiative that coordinates, develops, and supports telehealth as an integral component of e-Health policies and activities in Minnesota.
2. To develop and publish a dynamic directory of all existing telehealth services and functional capabilities in Minnesota in order to raise awareness of telehealth and to connect people and providers to services.
3. To identify telecommunications and health care regulatory and policy barriers to achieving telehealth goals and propose possible solutions.
4. To develop an open, interoperable, secure telehealth network that is accessible to all consumers and providers statewide and integrates with e-Health systems.

State agencies, such as the Minnesota Department of Health, Minnesota Department of Human Services, and the Office of Enterprise Technology are beginning discussions to ensure that public efforts are mutually supportive and align with identified priorities. Diverse partners such as the University of Minnesota, the Blandin Foundation, current telehealth providers and networks in Minnesota, North and South Dakota, telecommunications providers, and professional trade associations are also bringing their knowledge and experience to the table.

At the front and center of telehealth system development in Minnesota is one overarching goal: to be able to connect any patient in Minnesota with any health care provider. It is ambitious, but it is achievable. It is ultimately about access to health care for all rural Minnesotans.

The Main Street Pharmacy: Becoming an Endangered Species

Andrew P. Traynor, Todd D. Sorensen & Tom Larson

Ruralville is a peaceful, small town of 2,200 in rural Minnesota best known for the world famous homemade pie at The Corner Café. Folks come from miles around on a beautiful day for a slice of pie and coffee and to do some shopping at the local craft stores. Other than the occasional trips to larger nearby communities, the residents of Ruralville have little need to venture out of their community for their typical daily needs. The large constituency of rural elderly in this town are thankful for this situation as they need not venture far for their groceries, hardware supplies, church, social activities or health care.

The health care environment in Ruralville consists of a two-provider medical clinic attached to a 24-bed critical access hospital and 50-bed long-term care facility as part of a fairly new health care campus. On Main Street, between the Ruralville Hardware Store and First National Bank, Joe Johnson has owned and operated Ruralville Pharmacy for the past 40 years. Now 65 years old, Joe is looking forward to retiring to his cabin by the lake to enjoy some fishing, travel and time with his grandchildren. He has operated a good business and has been an integral part of the community in those 40 years.

Joe has served his patients and community well by providing much needed health information, education on medications, assistance with management of self-care issues, referral of patients to medical providers, drug information for medical providers, identification of problems with drug therapies, safe provision of medication distribution in his pharmacy, the hospital and the nursing home, participation in medication use committees, and community leadership in civic activities. These tasks have given Joe a very rewarding career, but over the years, Joe has had to keep up with the changes in technology and the need for an increasing diversity of medication inventory while profits have decreased

due to dwindling third-party reimbursement. Most recently, Medicare Part D has shifted many cash-paying customers to third-party coverage, decreasing Joe's profits to negligible percentages. Anticipating a significant drop in his business when the largest local employer changes its benefits to include a mail order pharmacy requirement at the beginning of the new year creates a bleak outlook on Joe's ability to transition ownership of his pharmacy. Many young pharmacists shadowed Joe prior to graduating from the University of Minnesota, but none have shown an interest in returning home to relieve him of his responsibilities.

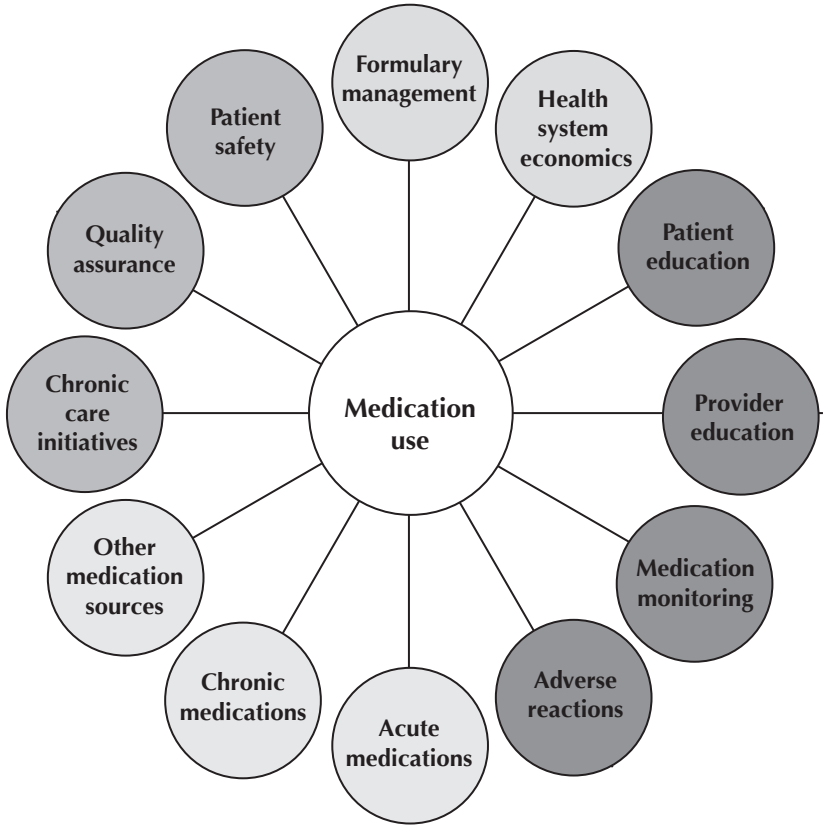
What will be the impact on Ruralville when Joe chooses retirement without transition of pharmacy ownership or services? Who will provide the services Joe offers to the community with the same quality? What are the implications to the hospital, nursing home and clinic when they lose the services Joe provides to them? What happens to the other Main Street businesses when patients are forced to visit neighboring communities for their medication needs?

While Ruralville is a fictitious Minnesota town, the situation facing it is very real and is increasingly common. Rural pharmacy practice operates in a fragile environment challenged by changes in the U.S. health care system, including increased competition from chain, mass-merchandiser, and mail service pharmacies; changes in third-party reimbursement; and the increased application of costly technology. Specifically, reduced profitability, challenges in hiring staff pharmacists and obtaining assistance from relief pharmacists when needed, decreased personal and professional flexibility of a pharmacist's time, and decreased interest in rural pharmacy ownership continue to be barriers to the delivery of pharmacy services in rural areas (Epstein, 1996; Billow, Van Riper, Baer, Stover, 1991; Traynor, Sorensen, 2005). A significant change in any critical factor or the introduction of a new risk factor has the potential to result in the closure of a local pharmacy, which can create significant challenges for rural residents, resulting in increased travel distances to pharmacies and, in turn, lower prescription refill rates (Xiao, Sorofman, Manasse, 2000; Xiao, Sorofman, Manasse, 2000). In this article, we will describe the current situation of rural pharmacies in Minnesota, the factors impacting the delivery of pharmacy services in rural Minnesota, the future outlook for rural pharmacies in Minnesota and potential solutions to maintain these critical health care services.

The Role of the Rural Pharmacist

The role of the rural pharmacist is multifaceted, and loss of this professional in the delivery of pharmacy services in rural communities has many implications. Pharmacists contribute many services to rural communities and residents beyond simply serving as a basic access point for medications. Figure 1 highlights the many roles and responsibilities of rural pharmacists managing medication use in a community. In addition, local access to pharmaceuticals and the knowledge of a pharmacist is a key part of the local health system, ensuring cost-effective medication use and the required provision of pharmacy services in hospitals and long-term care facilities (Casey, Klingner, Moscovice, 2002; Stratton, 2001). While rural pharmacists' roles may be assumed to be limited to retail pharmacy settings, a 2003 survey of one-pharmacy rural communities revealed that out of 33 rural communities with one

Figure 1: *Functions of the pharmacist in the Medication Use System.*

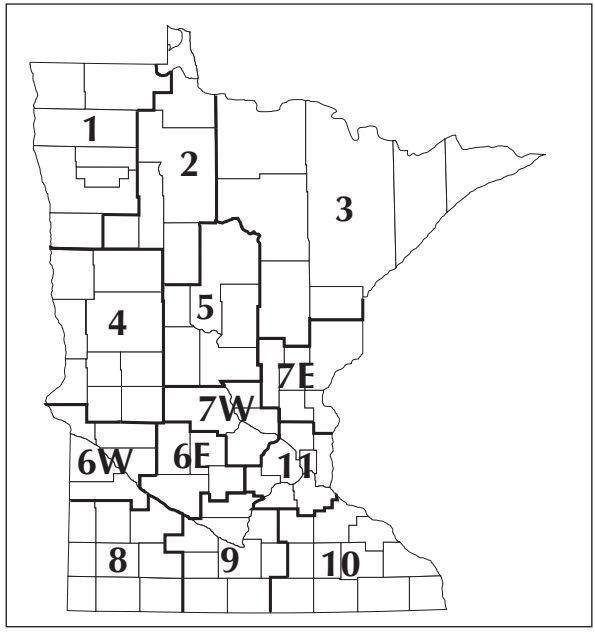


pharmacy and a small hospital, 11 community pharmacies were the source of hospital pharmacy staffing (Traynor, Sorensen, 2005). Every community has a system with applicable processes for addressing the distribution and use of medications in each of its health care settings. We refer to this system as the medication use system, and its effective management requires diligence on the part of someone with expertise of medication use and medication systems. Communities who are at risk for the loss of a local pharmacy must consider where this responsibility will fall if there is no local pharmacist present to participate in this system.

Workforce Trends and Issues Currently Facing Rural Communities and Rural Pharmacists

2005 Rural Pharmacist Workforce Review. The Minnesota Health Department, Office of Rural Health and Primary Care, State Board of Pharmacy and University of Minnesota College of Pharmacy have collaborated to maintain licensure data and keep the public apprised of changes occurring within the pharmacy workforce. Data has been extracted from the Minnesota State Board of Pharmacy Pharmacist Licensure database and summarized by county, economic development region (Figure 2), and state.

Figure 2: *Minnesota Economic Development Regions.*



- Distribution of pharmacists: Over the past ten years, the number of pharmacists licensed to practice in Minnesota has risen by almost 1,200 pharmacists and continues to rise. There were 4,720 licensed pharmacists living in the state of Minnesota in 2005. Similarly, the number of active pharmacists per 10,000 Minnesota residents has increased recently, moving from 8.0 to 9.15 over the past ten years (Table 1).

  The distribution of pharmacists in Minnesota is closely associated with population centers: the portion of licensed pharmacists living in the community is directly related to the size of the community's population. Approximately 58% of active pharmacists live within the seven-county metropolitan area (Region 11). The ratio of pharmacists per 10,000 residents ranges from 5.7 in Region 1 to 10.8 in Region 10. There is a wide disparity in the ratio of pharmacists to residents at the county level of analysis: Kittson, Pine, Waseca, Cass, Mahnomen and Lac Qui Parle counties all have ratios of less than 4 per 10,000 residents, while Olmsted County has a ratio of 20.8.

Table 1: *Minnesota pharmacists, selected regional demographic data, 2005.*

Region	% of state's pharmacists	Average age	Active pharmacists per 10,000 residents	% Male	% who are Tri-State graduates+	% holding a Doctor of Pharmacy degree
1	1.1%	54.1	5.7	66%	96%	4%
2	1.6%	48.7	9.1	65%	91%	16.2%
3	6.3%	49.3	9.1	63%	86%	17.7%
4	3.9%	49.5	8.6	60%	95%	16.6%
5	2.5%	50.3	7.4	65%	95%	14.0%
6 East	2.0%	48.8	8.0	60%	77%	18.8%
6 West	0.7%	55.6	6.9	65%	89%	8.8%
7 East	2.3%	46.8	7.1	57%	100%	22.4%
7 West	6.0%	43.8	8.1	54%	88%	30%
8	1.8%	51.1	7.1	65%	95%	12.8%
9	3.2%	50	6.6	66%	95%	13.3%
10	10.9%	45.3	10.8	60%	87%	23.6%
11	57.7%	44.8	9.7	47%	63%	31.3%

+ University of Minnesota, South Dakota State and North Dakota State graduates.

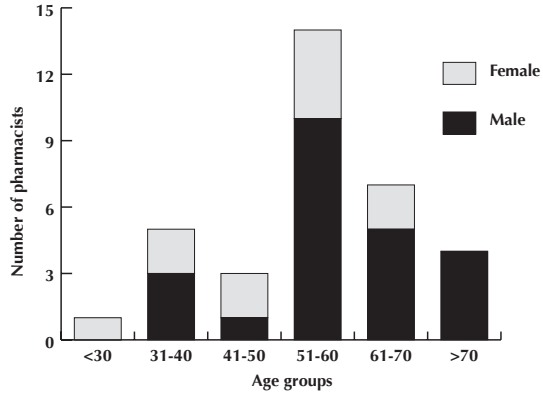
- Average age: Since 1995, the average age of pharmacists in Minnesota has risen steadily, from 42 years to 46.1 years in 2005. Thirty-six percent of pharmacists are over 50 years of age, while 4% are over 70. This cohort is balanced by the 40% who are under 40 years of age. Distribution by age across the state is also not uniform. Each region and county has a unique distribution that may be very different from that of the state as a whole. As an example, Figure 3 shows how age groupings differ between Region 6 West and Region 8. In general, the age distribution of Regions 10 and 11 are closest to that of the state. Regional differences in average age are modest, ranging from 43.8 years (Region 7 West) to 55.6 years (Region 6 West). The average age at the county level ranges from 40 in Dodge and Scott counties to 65 in Kittson County. The average age was over 60 in Big Stone, Sibley, Swift, Jackson, and Norman counties in 2005.

- Gender: Perhaps the greatest change in pharmacist demographics has occurred in the gender composition of the workforce. As recently as 1975, the proportion of female pharmacists was reported to be less than 20%, but by 2005, the proportion of women in the pharmacist work force had risen to 47%. Male pharmacists currently outnumber their female counterparts in all regions except Region 11 (seven-county metro), where men represent 47.2% of the work force. The proportion of males was greatest in Region 9 (66%) (Table 1).

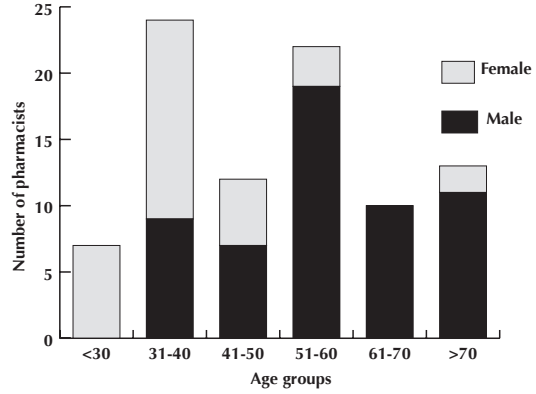
- Education: Historically, the majority of pharmacists in Minnesota graduate from schools of pharmacy in Minnesota, North Dakota or South Dakota. In 2005, 50.5% of Minnesota pharmacists graduated from the University of Minnesota, 21.5% from North Dakota State University and 10% from South Dakota State University. Among those pharmacists younger than 30, a greater proportion have come from schools other than these Tri-State schools. Region 10 varies the furthest from the state average, where 38% of the pharmacists graduated from a non Tri-State school. Region 10 also leads in diversity of alma mater in the youngest age category, where only one-third of these pharmacists are from the Tri-State schools.

- Licensed community pharmacies: The number of licensed pharmacies in 2005 was slightly higher than in previous years, with a slightly greater number of chain-owned community pharmacies and a lower number of independently owned

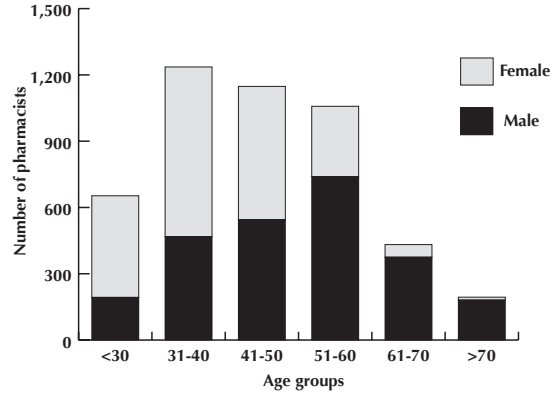
***Figure 3**: 2005 age and gender distribution: Region 6 West, Region 8 and state.*



Region 6 West



Region 8



State

pharmacies. While overall the number of chain-owned pharmacies outnumbered those independently owned, in rural areas independently owned pharmacies remain the predominant pharmacy type in the state's smallest rural communities. Pharmacists continue to be primarily employed by the community/retail pharmacies. Every county in Minnesota has at least one licensed community pharmacy. Lake of the Woods, Marshall, Red Lake, Mahnomen, Murray and Dodge counties have only one licensed community pharmacy each, while seven other counties have only two.

Current Issues. One of the most significant challenges facing rural communities is the closure of local pharmacies. While the closure of pharmacies is occurring in rural communities of all sizes, communities that host only one pharmacy face the greatest degree of risk since the closure of this one pharmacy would result in the loss of local access to a pharmacist and medications. In Minnesota, there are currently 126 communities that are served by only one pharmacy. The communities represent a population of 216,000 residents within their city limits. The population served by these pharmacies, however, is larger, considering the surrounding service areas (Traynor, Sorensen, 2005). From 1996 to 1999, there were 38 pharmacy closures in rural areas, nine of which resulted in a community no longer having a local pharmacy (Casey, Klingner, Moscovice, 2001). More recently, a review of pharmacy closures in 2005 revealed 29 closures in Minnesota, 12 of which were located in rural areas. As a result of these closures, two rural communities lost local access to a pharmacy. In addition, nine communities have become one-pharmacy communities since 2003.

Because independent pharmacy ownership is the predominant ownership type in the state's smallest rural communities, factors that challenge transition of ownership in rural communities increase risk for loss of access to pharmacy services. Currently, the number of rural pharmacy owners seeking to transition ownership of their businesses is notable. A recent survey of pharmacy owners in one-pharmacy communities showed that nearly 30% of owners were hoping to transition ownership within three years and more than 60% hoped to transition ownership within the next 10 years (Traynor, Sorensen, 2005). If these owners are unable to transition ownership, many communities may see the closure of their local pharmacy.

Unfortunately, there is reason to believe that ownership transition will be challenging. While many new pharmacy graduates appear to have an interest in living and working in rural

Minnesota communities, few have expressed an interest in pharmacy ownership. Nearly 63% of students responding to a survey on rural pharmacy issues indicated that they were giving serious consideration to practicing in a rural community with a population of less than 5,000. However, only 27% of respondents had given serious consideration to pharmacy ownership. Of the students expressing interest in rural pharmacy practice, most were interested in staff pharmacist positions, but not ownership. The respondents who indicated they were not giving serious consideration to pursuing full ownership of a community pharmacy ranked "responsibilities and time commitment" and "choice of lifestyle to maintain" as either being of moderate or great influence (Traynor, Sorensen 2005).

Additional evidence of the lack of young pharmacists moving into rural communities comes from the Lake Superior Rural Cancer Project, a multidisciplinary approach to test strategies for managing and improving cancer diagnosis in rural areas of Michigan, Minnesota, and Wisconsin. Reviewing the workforce demographics of health care practitioners in the areas encompassed by this project showed that only 6.4% of pharmacists had been in their positions five years or less, compared with 48% of nurses and 44% of physicians. Conversely, 40% of pharmacists had been in their current positions longer than 20 years (Gangeness, 1997). The disconnect between the practice opportunities desired by young pharmacy practitioners and those that primarily exist in rural communities has contributed to this workforce disparity.

The ability to hire full- and part-time pharmacy staff is a continuing challenge for pharmacy owners and managers in rural communities. According to 2001 Minnesota workforce data, 84.6% of respondents reported great difficulty in hiring pharmacists (Hansen, Schommer, Larson, 2001). The challenges experienced by rural pharmacies in hiring staff and relief pharmacists result from many factors, including the rural pharmacy's inability to offer competitive salaries and benefits compared with pharmacies in urban areas (Epstein, 1996). In addition, the variety of professional opportunities for the spouses or "significant others" of pharmacists are often limited. Compounding this problem is the high demand for pharmacists, which has steadily increased the salary and benefits offered to pharmacists regardless of the geographic area in which they practice (Pederson, Schommer, 2001). Decisions about where to practice pharmacy increasingly depend on personal and professional lifestyle choices. A 2002 Minnesota pharmacist vacancy survey revealed that 45% of all rural pharmacist positions had been vacant

more than 10 months, compared with only 25% of urban pharmacist vacancies (Gangeness, 1997). Furthermore, 22.5% of Minnesota pharmacists in rural counties were over age 55 in the late 1990s, compared to just 14.1% in urban counties at the same time (Larson, Uden, Hadsall; 1999).

Impact of Medicare Part D. Medicare Part D has had a tremendous impact on both rural residents and rural pharmacists. For rural residents, this program has largely been a beneficial addition to Medicare. Prior to 2006, nearly one half of rural seniors lacked prescription medication coverage. The fact that rural residents are more dependent on medications due to a higher prevalence of chronic conditions (Gangeness, 1997) further adds to the positive impact of the program on these citizens. However, the implementation of Medicare Part D on January 1, 2006, marked a date of notable change for community pharmacies in the United States, particularly for rural pharmacists. Prior to this date, rural pharmacists were already facing numerous challenges such as those mentioned previously. The implementation of Medicare Part D created additional burdens unique to the delivery of pharmacy services in rural communities. The percentage of prescriptions moving from cash to being paid by less profitable third-party payers, such as prescription drug plans, is higher in rural areas than in urban areas (18% vs. 13%). For all pharmacies, this reduction in margin on prescriptions places a greater burden on non-medication related sales; however, independent pharmacies — which comprise 48% of rural pharmacies vs. 29% of urban nationally — are much more dependent on prescription medication sales revenue (93%) compared to chain stores (65%) (Fraher, Slifkin, Smith, Randolf, Rudolf, Homes, 2005). The result is that the ability to maintain a financially viable practice has become disproportionately more challenging in rural communities.

There is an irony with Medicare Part D when one considers that, for many rural citizens, a program that was intending to increase access to affordable medications may actually dramatically limit access due to its role in facilitating the closure of many rural pharmacies. With the disproportionately negative impact of Medicare Part D on rural pharmacies, we can only expect that the issue of pharmacy closures and the number of rural communities losing local access to local pharmacy services will escalate.

The Broad Effects of Pharmacy Loss. It is important to note that the closure of pharmacies in rural communities has the potential to

affect the healthcare system dynamics in the community beyond medication use: it may also affect the community's economy. For example, if a rural pharmacy closes, use of the local primary care clinic may decrease as well, because of a lack of prescription access at the point where a physician's care is received. Use of pharmacies in neighboring towns may result in use of primary care clinics in the same neighboring town.

In addition, a study of the association between pharmacy closure and prescription drug use in Iowa Medicaid patients showed significantly fewer prescription claims for patients after their pharmacy closed compared to pre-closure utilization rates. Medicaid patients who experienced no change to their pharmacy access had more prescription claims, and this difference remained significant after controlling for patient demographics and health status (Xiao, Sorofman, Manasse, 2000). If all medications prescribed are necessary, those individuals living in a community that had its pharmacy close are likely receiving less-than-optimal treatment for their health conditions.

Finally, another implication of pharmacy closure is increased travel distance for patients. Analysis of pharmacy closure in Iowa also showed that Medicaid patients who experienced a pharmacy

Figure 4: *Service comparison - presence of local pharmacist vs. remote operations (telepharmacy/mail order).*

Activity	**Local Pharmacist**	**Remote Service**
Availability of acutely needed medications	Frequent/Always	Frequent
Availability of Chronic Medications	Frequent/Always	Frequent/Always
Assistance with self medication	Always	Sometimes
Provision of verbal medication education at time of receiving medication	Always	Sometimes
Local awareness of community medication use issues	Frequent	Rare
Regular collaboration with local medical providers	Frequent	Rare
Ability to recognize new medical problems and refer to medical providers	Always	Rare
Ability to prospectively recognize medication use problems in institutional settings and consistently contribute to broad medication use management	Always	Rare
Contribution to local community economy	Frequent	Sometimes

closure were subjected to greater travel distances compared to those patients whose pharmacies remained open (Xiao, Sorofman, Manasse, 2000). In Minnesota an assessment of "one-pharmacy" towns reported that on average, members of a community would travel 21.4 miles one way to a neighboring community to access medications if their local pharmacy closed (Traynor, Sorensen, 2005). While remote operations such as telepharmacy and mail order services may provide local access to some medications, Figure 4 highlights the typical differences in scope of services provided by local vs. remote pharmacy operations.

Implications to Rural Main Streets. Looking beyond health care services, the economics of a rural community can be harmed if residents must visit neighboring communities for medication needs, potentially leading them to conduct other forms of business in the neighboring community as well. While multiple factors such as local tourism and service needs may impact local economies, preliminary research of the closure and anticipated closure of Main Street pharmacies in specific towns reveals that pharmacy closures may have a direct impact on local economies. Upon the closure of the pharmacy in one community studied, 75% of businesses surveyed agreed or strongly agreed that the community was spending less money in town. Businesses citing pharmacy closure specifically as affecting their businesses included restaurant and retail businesses (Harder, 2001). A survey of patients in a community where closure of a pharmacy could be a possibility revealed that they would conduct other forms of business in a community if they traveled there for pharmacy services. Respondents largely indicated that they would travel to a community where multiple retail needs could be met (Austin, 2005). Communities must consider the impact on local businesses and perceptions of community members related to conducting business in a community without pharmacy services when faced with the possibility of a pharmacy closure.

Educating the Next Generation of Rural Pharmacists

So how do we work to facilitate an increased presence of young pharmacists in rural communities? One suggestion comes from research of physician education, which has revealed that students originally from rural areas and residents trained in rural areas are more likely to practice in rural areas. An example of this is the University of Minnesota Rural Physician Associate Program (RPAP). Established in 1971, RPAP is a program that allows third-year medical students to participate in a nine-month primary care

elective in rural Minnesota. Living and learning in rural Minnesota, over 1,000 medical students have participated in this program. Of the 641 RPAP alumni practicing in Minnesota, 64% are practicing in rural areas. Coupled with rural training that values generalism, community responsive practice and rural life, this type of medical training has been a recipe for improving the flow of medical practitioners to underserved areas (Rural Physician Associate Program Summary, 2004-2005).

A coordinated effort is required to expand the dissemination of new pharmacy practitioners to rural areas and to prevent the loss of pharmacy services in small rural communities. Partners in these efforts may include colleges of pharmacy, professional associations, regional Area Health Education Centers, state government, and individual communities and health systems. An example of these efforts is the plan developed by the University of Minnesota College of Pharmacy to expand the size of its classes to help address workforce demands in the state. The College expanded its pharmacy program to the University of Minnesota, Duluth campus, where approximately 50 student pharmacists are admitted each year (in addition to 105 students at its Twin Cities campus). Expanding the pharmacy program to Duluth has allowed the College to attract more individuals from Greater Minnesota. Approximately 50% of students currently admitted to the College's Duluth campus were originally from rural communities, compared to 25% of Twin Cities students. In addition, the College has worked to expand experiential education opportunities for student pharmacists and pharmacy residents in rural communities across the state. These efforts have resulted in more student pharmacists coming from rural communities, as well as creating opportunities for them to train in rural communities, and as a result we will see outcomes similar to the Rural Physician Associate Program and observe an increased number of young pharmacists choosing to practice in rural communities across the state.

Opportunities/Advancements

In 2005, the Minnesota Legislature passed two provisions that have the potential to lessen the risk for loss of rural pharmacy services. A Rural Pharmacy Planning and Transition Grant Program, administered by the Office of Rural Health and Primary Care, was created to provide funding for communities seeking to plan and/or implement steps to maintain access to medications and the knowledge of a pharmacist. A total of $180,000 is available each year for grant requests not exceeding $50,000 (Minnesota Office of Rural Health and Primary Care website, 2006).

The second provision was expansion of the Office of Rural Health and Primary Care's rural pharmacy loan forgiveness program to include pharmacists practicing in rural areas. Prior to 2004, pharmacists were not eligible for this program. Now, graduating students, pharmacy residents or licensed pharmacists may currently receive approximately $13,500 of education loan forgiveness for a three-year consecutive service commitment to rural areas (Minnesota Office of Rural Health and Primary Care Website, 2006).

Another opportunity for maintaining access to pharmacists and pharmacy services in rural communities may come in the way of developing service networks. Currently, most pharmacies in small rural communities conduct business as independent entities and have no significant source of support for activities related to staff recruitment, managing purchasing contracts, business consulting services, etc. A project was recently completed exploring the feasibility of creating a service network to support pharmacies and pharmacists in southwestern Minnesota. The project identified many opportunities where a network would create efficiencies and value-added benefits to existing pharmacy practices, within both community pharmacies and small rural hospitals. Work is under way to put into action this concept, which may serve as an important component in maintaining the viability of rural pharmacy practices in the future.

Proposed Solutions/Recommendations

There are a number of ways community residents can support the resolution of issues challenging rural pharmacy practices, and by doing so, residents can help ensure the presence of pharmacists and pharmacy services in their local communities. A few of these opportunities are presented here:

- Most importantly, communities need to recognize that there is a risk for loss of local pharmacy services. They should take time to understand the issues creating this risk, then engage in dialogue among community leaders, pharmacists, health care administrators and policy makers to define and address solutions to these problems.

- Related to this, communities need to understand the role of the pharmacist and the delivery of pharmacy services in their communities. The role of the pharmacist and a local pharmacy extends well beyond serving as a basic access point for medications. Pharmacists contribute in many ways to creating

successful outcomes of medication therapy. The presence of pharmacy services in a local community is a key component of the broader health care delivery system, as well as the strength of the local economy.

- Rural residents should seek opportunities to engage in advocacy, particularly with state and federal legislators, concerning the impact of government programs that affect medication use and accessibility. One idea that has been suggested is creating a federal "critical access pharmacy" designation similar to the "critical access hospital" program, which helps rural health care facilities that don't have the size and scope to operate successfully in today's health care system.

- Communities and health care leaders should seek to partner with pharmacists to develop mechanisms that integrate pharmacists more fully into the rural community's health care system. Isolation of pharmacy services to one site can contribute to a lack of interest on the part of new pharmacy graduates who otherwise would be interested in pursing positions in rural communities. Collaborative approaches to care have frequently been shown to improve the outcomes of medication therapy. Interest in rural pharmacy practice is increased when student pharmacists are presented with a practice opportunity that integrates them in the rural health system, focusing on multiple pieces of the medication use process (Traynor, Sorensen 2005). When asked on a survey, more than twice as many Minnesota, North Dakota and South Dakota student pharmacists indicated that they would find opportunities such as this more appealing than traditional pharmacy practice opportunities (Traynor, Sorensen 2005). Prospective development of new practice opportunities in rural areas may be an effective answer for communities struggling to achieve transition of local pharmacy ownership.

- Community leaders should seek to benefit from the Rural Pharmacy Transition and Planning Grant program administered by the Minnesota Office of Rural Health and Primary Care, as well as leverage opportunities with other grant programs.

- Community leaders must consider developing innovative approaches to recruitment of pharmacists to rural communities, much in the way that is done with other professionals such as

physicians. The average individual graduating from pharmacy school has seven to eight years of university experience, and as the age of pharmacy graduates increases, they are more likely to have spouses or significant others that have or are seeking professional careers of their own. This strongly influences the choice of a community in which the family will choose to live and work. Additionally, opportunities for young pharmacists to gradually take over ownership of a rural independent community pharmacy are often limited, and therefore "junior partnership" programs should be developed (Traynor, Sorensen, 2005).

- Finally, rural community residents make choices on a daily basis that affect the viability of local pharmacy services and the presence of a pharmacist in their communities. Residents should consciously consider choices about where they obtain medications, such as through mail order and "big box" retailers in neighboring communities. Additionally, the choice of insurance or Medicare Part D plans affects local pharmacists and the availability of services. For example, several Medicare Part D plans include provisions in their medication benefit programs that pay pharmacists to help patients better manage their drug therapy. Rural seniors not only would personally benefit from choosing plans to include payment for this service, but the availability of this opportunity to local pharmacists creates a new revenue source that improves fiscal viability of the pharmacy practice.

Conclusion

Rural pharmacy services are currently operating in a fragile environment, challenged by financial implications including costly technology use and unfavorable reimbursement mechanisms. Additionally, workforce issues in traditional rural pharmacy practice models impact the ability for current rural communities to recruit and maintain medication use experts who serve a variety of functions. Should rural residents lose access to medications, a "domino effect" may occur in rural communities resulting in further health care access and economic issues. Solutions must be explored that encourage partnerships among multiple stakeholders, focusing on community awareness and support, advocacy efforts, integration of multiple pharmacy aspects within rural health systems, potential funding for innovative programming, and innovative pharmacist recruitment to rural areas. Failure to achieve awareness of the issues or to explore multiple solutions collaboratively may result in future health care access issues in the very near future.

References

Austin, M. The Local Pharmacy has Closed: Social and Economic Implications for Residents and Businesses [pharm D IV thesis]. Minneapois (MN): University of Minnesota; 2005 22 p.

Billow JA, Van Riper GC, Baer LL, Stover RG. The crisis in rural pharmacy practice. Am Pharm. 1991;NS31(12):51–3.

Casey M, Klingner J, Moscovice I. Access to rural pharmacy service in Minnesota, North Dakota, and South Dakota, Working Paper Series.
Minneapolis: Rural Health Research Center–University of Minnesota; 2001.

Epstein D. Can rural pharmacy survive? Drug Topics. 1996(Jul 22);140:58–60,62–3.

Fraher EP, Slifkin RT, Smith L, Randolf R, Rudolf M, Homes GM. How might the Medicare Prescript Drug, Improvement and Modernization Act of 2003 affect the financial viability of rural pharmacies? An analysis of preimplementation prescription volume and payment sources in rural and urban areas. Journal of Rural Health. 2005:21(2):114-21.

Gangeness D. Pharmaceutical care for rural patients: ominous trends. J Am Pharm Assoc. 1997;NS37:62–5,84.

Hansen R, Schommer J, Larson T, et al. Minnesota pharmacist workforce: a pharmacy perspective. Minn Pharm. 2001;55(4):17–20.

Harder P. The Local Pharmacy has Closed: Social and Economic Implications for Residents and Businesses [pharm D IV thesis]. Minneapois (MN): University of Minnesota; 2001 26 p.

Larson TA, Uden DL, Hadsall RS. Demographics of Minnesota pharmacy: trends in rural Minnesota. Minn Pharm. 1999;53(4):9–14,24.

Minnesota Department of Health, Office of Rural Health and Primary Care, Professions Web site. Accessed at http://www.health.state.mn.us/divs/chs/grants.htm#pharmacy, December 8, 2006.

Minnesota Department of Health, Office of Rural Health and Primary Care, Professions Web site. Accessed at http://www.health.state.mn.us/divs/chs/pharmloan.htm, December 8, 2006.

Pedersen CA, Schommer JC. Agenda for pharmacy: workforce issues. J Am Pharm Assoc. 2001;41:368–9.

Rural Physician Associate Program Summary. Minneapolis: University of Minnesota Medical School; 2004–2005:8.

Traynor AP, Sorensen TD. Assessing risk for loss of rural pharmacy services in Minnesota. J Am Pharm Assoc. 2005;45:684–93.

Traynor AP, Sorensen TD. Student pharmacist perspectives of rural pharmacy practice. J Am Pharm Assoc. 2005;45:694–9.

Xiao H, Sorofman B, Manasse H, et. al. Impact of pharmacy closures on patient use of prescription drugs. J Soc Admin Pharm. 2000;17:25–33.

Xiao H, Sorofman B, Manasse H. The association between pharmacy closures and prescription drug use: a retrospective analysis of Medicaid prescription claims in Iowa. Am J Manag Care. 2000;6:366–72.

Long-term Care in Greater Minnesota

LaRhae Knatterud

"Between now and 2030, Minnesota will experience the most dramatic population shift in its history. Along with the rest of the nation and the world, we will become older not just as individuals but as a society. By 2030, 1.3 million persons, or one out of every five Minnesotans will be over age 65, compared to one out of every eight today.

Later, in 2050, 324,000 Minnesotans will be over age 85, the largest number ever. These elderly will need health and long-term care services, supportive housing and age-friendly communities. Because of the size of this group, their need could overwhelm the traditional response of family, communities and government."

Final Report for Project 2030, 1998

When this paragraph was written, the demographic trends described were already a reality in Greater Minnesota. Most Greater Minnesota counties already had the characteristics that the rest of the state would have in 2030. The issues that relate to the aging of the population have been affecting families, communities and government in Greater Minnesota for a decade. Greater Minnesota communities and the organizations that provide long-term care to the elderly there are addressing the issues of long-term care in a variety of ways out of necessity.

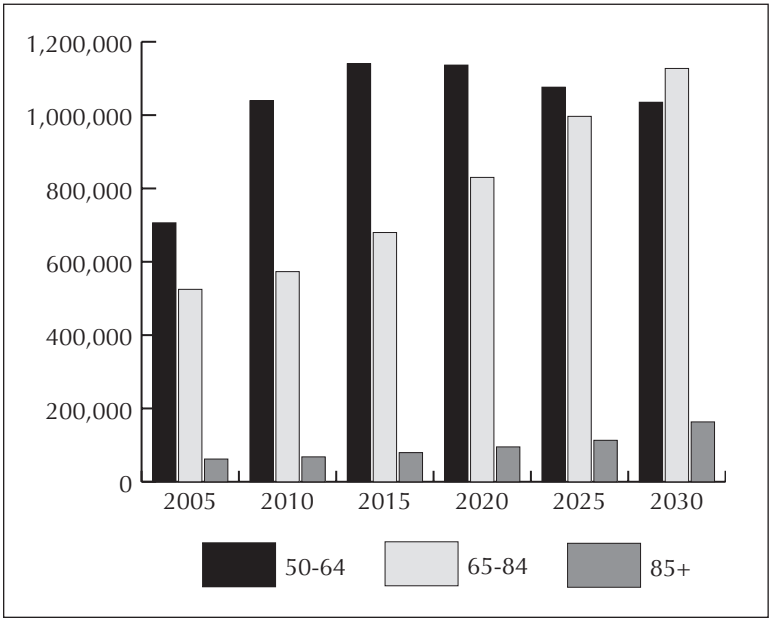
In this article, we will describe some of the key demographic aging trends in Greater Minnesota and how these relate to the need for and issues surrounding long-term care for older persons living in Greater Minnesota. In addition, we will describe some of the responses that state and local organizations are developing to address these changes.

Demographic Aging Trends in Greater Minnesota

For purposes of this discussion, our definition of long-term care is "assistance given over a sustained period of time to people who are experiencing long-term inabilities in functioning because of a disability" *(Ladd, Kane, Kane, 1998)*. The term long-term care as used here refers to care provided in all settings, including homes, apartments, residential settings and nursing homes. While the issues and options analyzed here are from the perspective of the elderly, many of the options may be relevant to younger individuals who need long-term care services. In addition, the definition of Greater Minnesota used here is all those counties outside the seven-county Metro Area. (There are many definitions of Greater Minnesota used by various groups, but this is the author's definition.)

Greater Minnesota is older than urban Minnesota. Minnesota will experience a permanent shift in the age of its population over the next 25 years, and by 2030, we will have 1.3 million persons over 65, about 20% of the state's population. In the southwest and west central portions of the state, however, 20% of the population is already over 65. While 30% of the state's total population lives in

Figure 1: *Minnesota's aging population, ages 50-85+, 2005-2030.*



Source: Minnesota State Demographer's Office, 2004.

Greater Minnesota, 41% of those over 65 lives there. All the counties in which more than 20% of the population is 65+ are in Greater Minnesota.

The numbers of elderly over 85 in Greater Minnesota will rise by 2030. As Minnesota's population ages, the need for long-term care increases. This increase is closely linked to the rise in the 85+ population specifically. In 2000, there were 85,601 persons over age 85. Between 2000 and 2030, the number will double, increasing to 163,310, and then double again by 2050, rising to 323,603.

Overall, the numbers of 85+ in Minnesota will increase 96% between 2000 and 2030. Within various regions of the state, the increase will vary from 30% up to 129%. While all these increases are significant ,the percent increases will not be dramatic in most of the Greater Minnesota regions, because the proportion of the total population that is over 85 is ***already*** so high (see Table 1.)

Dependency ratios will climb. Another measure of aging in Greater Minnesota is the elderly dependency ratio. This is defined as the ratio of the number of persons age 65 and over to every 100 persons age 15 to 64, essentially the working age population. Demographers use this ratio to measure the extent of the growth in the elderly population and compare that to the growth in the

Table 1: *Changes in Minnesota's 85+ population by region of the state, 2000 – 2030.*

Geographic Area	85+ Population			85+ 2000 – 2030 Change	
	2000	**2010**	**2030**	**Absolute**	**Percent**
East Central	10,880	14,260	24,910	14,030	+129.0
Northeast	7,170	8,744	12,190	5,020	+70.0
Northwest	3,788	4,340	6,150	2,362	+62.4
Southeast	13,221	16,480	23,400	10,179	+77.0
Southwest	9,004	9,920	11,780	2,776	+30.8
Twin Cities Metro	32,870	46,090	75,040	42,170	+128.3
West Central	6,196	6,920	9,860	3,664	+59.1
Total	**83,129**	**106,754**	**163,330**	**80,201**	**+96.5**

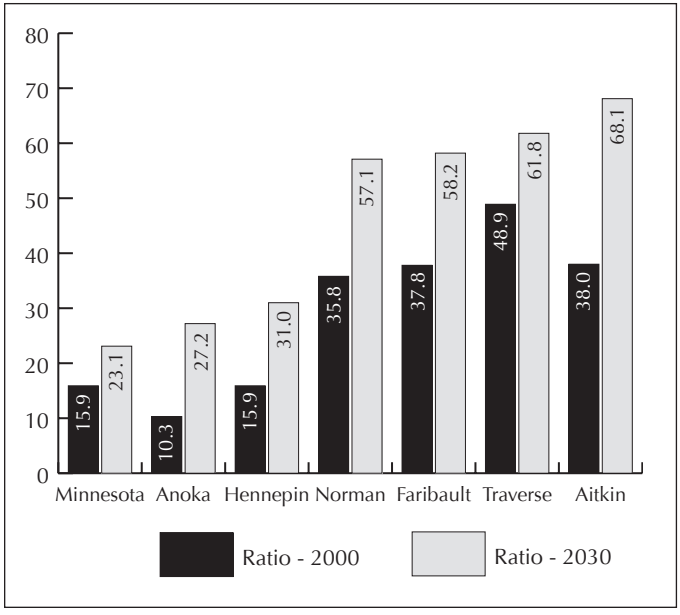
Source: Minnesota State Demographer's Office, 2004, included in LarsonAllen, "Noticeably Different, Minnesota's Changing Long-Term Care Landscape: Implications and Challenges," November 11, 2006.

working age population. This ratio also allows comparison across various locations using a common measure. In Minnesota, the elderly dependency ratio has been fairly stable for many years, hovering at about 18 elderly residents per 100 working-age residents. However, with the increasing number of persons 65 and over, the dependency ratio will skyrocket between now and 2030, rising to about 30.

Once again, Greater Minnesota already has high elderly dependency ratios. In the west central and southwest counties of Minnesota, 32 counties had an elderly dependency ratio of 31 in 1995, and these will grow to extremely high levels by 2030. For example, several Greater Minnesota counties will experience elderly dependency ratios over 60 (see Figure 2).

The status and needs of elderly in Greater Minnesota are somewhat unique. Some recent research on the elderly and their status and needs in Minnesota provide some additional information on how Greater Minnesota elderly compare to urban elderly. The Survey of Older Minnesotans completed by the Minnesota Board on Aging in 2005 contains interesting differences between older persons in Greater Minnesota and the Twin Cities Metro Area (*Survey of Older Minnesotans, 2005).*

Figure 2: *Elderly dependency ratio in Minnesota and selected counties, 2000 and 2030.*



- Greater Minnesota elderly are more dependent upon Social Security for their income: 26% of Greater Minnesota elderly indicate that Social Security is their major source of income compared to 18% for urban elderly.
- 89% of Greater Minnesota elderly compared to 74% of Metro Area elderly used public transportation in the past year.
- When asked how they would pay for nursing home care, 23% of the Greater Minnesota elderly said they would use a government program, compared to 16% in the urban area.
- Fewer elderly would like to be working for pay in Greater Minnesota (20%) compared to urban elderly (24%).
- More urban elderly consider themselves employed (53%) than the Greater Minnesota elderly (43%).
- In terms of educational status, a greater proportion of urban elderly have postsecondary education of some type (70%) compared to the Greater Minnesota elderly (53%).
- More Greater Minnesota elderly than urban elderly (73% vs. 67%) indicated that they need some assistance to stay in their home, e.g., home repair or renovation, additional accessible features such as ramps or grab bars.
- More urban elderly (14%) vs. Greater Minnesota elderly (9%) were planning to move to another type of housing in the near future.
- More Greater Minnesota elderly (34%) currently live in senior housing than urban elderly (29%).
- A much larger proportion of Greater Minnesota elderly live in single-family homes (77%) than urban elderly (63%), and the urban elderly are more likely to live in apartments (20%) than Greater Minnesota elderly (10%).
- Neither the Greater Minnesota nor urban elderly indicated that they worry about getting good health care (49% vs. 50%).
- Most Greater Minnesota and urban elderly felt that the health care they received in the past year was excellent (52% vs. 50%).

- Fewer Greater Minnesota elderly indicated that their health status was "excellent" and more said it was "fair" (22% and 18%) compared to the urban elderly (27% and 14%).
- A greater proportion (41%) of Greater Minnesota elderly participated in vigorous activities each week than did Metro Area elderly. Interestingly, more older elderly (75+) exercise vigorously than the young old (65 – 75).

Another source of comparative data is a 2005 report on the health status of rural Minnesotans completed jointly by the Office of Rural Health and Primary Care and the Minnesota Center on Health Statistics at the Minnesota Department of Health. This report found that the health status of older people in rural areas is similar to that of urban elders in many areas but different on certain indicators *("Health and Well-Being of Rural Minnesotans: A Minnesota Rural Health Status Report," 2005).*

- Greater Minnesota elderly are more likely to be hospitalized from unintentional falls than urban elderly (48.5% vs. 44.4%).
- Compared to Metro Area residents, residents in Greater Minnesota had higher overall mortality rates in all the top five leading causes of death — heart disease, cancer, stroke, unintentional injury and chronic obstructive pulmonary disease (926.2 vs. 633.6 per 100,000).
- Deaths from motor vehicle crashes for people 65 and over were much higher in Greater Minnesota than the Metro Area (25.8 vs. 17.2 per 100,000).
- Elderly adults in Greater Minnesota experience more tooth loss due to decay or gum disease than their Metro counterparts (46% vs. 32.3%).
- The rate of suicide death is slightly higher among residents of Greater Minnesota than among urban elderly (11.3 vs. 10.7 per 100,000).

Long-Term Care Issues Facing Greater Minnesota Seniors

In January 2006, the Minnesota Department of Human Services, the Minnesota Department of Health, and the Minnesota Board on Aging co-sponsored a series of meetings around the state to discuss the impact of the state's aging population and engage Minnesotans

in a discussion on what needs to happen to prepare for the coming age wave of older people. These meetings were held as a first step in a project called Transform 2010, a project to identify the impacts of the aging of the state and prepare a response to address these issues. Over 1,000 individuals participated in these meetings, and most of the meetings were held in Greater Minnesota. Many of the issues discussed were related to long-term care needs in Greater Minnesota and provide a first-hand account of the current status of long-term care for the elderly across Greater Minnesota.

1. **The large population of older persons represents a critical human resource for the state, especially in Greater Minnesota.**

Between 2005 and 2025, Minnesota will have the largest group of persons between ages 60 and 80 ever in the state's history. Participants at the meetings spoke of the tremendous resource that this group represents to the state. Because of improvements in health and longer life expectancies, this group at age 65 will have 30 or more years for continued activity and productive pursuits. Older persons represent a major part of the population in most Greater Minnesota communities and their role in work, volunteer, civic engagement, family, and faith communities are crucial to the civic life of their communities.

Many are continuing to work, helping to fill the worker shortage in Greater Minnesota. Others are combining work with leisure, lifelong learning, volunteer efforts, or family, community and civic activities.

2. **Our society does not place enough emphasis on preventing health problems and disabilities in the first place.**

The importance of healthy living in order to prevent chronic conditions that lead to disability was a big topic of discussion. There is a societal attitude that taking pills to treat health problems is easier than practicing healthy habits and preventing problems in the first place. We need to counteract these messages and motivate individuals to make behavioral changes, not only to prevent disability but to reduce health care costs associated with disability.

3. **Changes in families are reducing their ability to provide care for their older relatives.**

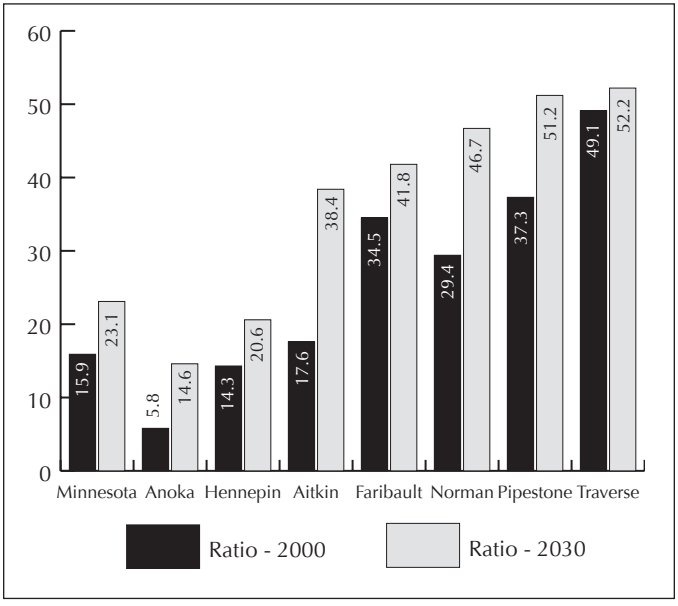
Participants described the changing nature of family life and the pressures that contribute to reduced ability of families to provide care for older relatives. The biggest pressures include smaller family size, increases in the number of older relatives to care for, and the

movement of family members into more urban areas to find better paying jobs. Increased labor force participation of women is also a factor.

In Minnesota, about 92% of long-term care needed by older persons in the community is provided by families, but this percent has been gradually declining over the past 20 years *(Survey of Older Minnesotans, 1988 – 2005).* Participants felt that most families want to care for their older relatives as long as they can, and the state needs to support that sense of obligation and help families provide assistance to their relatives. Along with changes in families, those at the meeting also talked about the urgent need for improved systems of community protection for growing numbers of frail elderly, who are living in the community longer rather than moving to nursing facilities, and thus may be vulnerable to abuse, neglect or exploitation.

Despite the lower availability of caregivers in Greater Minnesota communities, the "informal system" of family, friends and neighbors provides the most care for seniors, often for many years. People tend to know their neighbors and have close family and social relationships. Participants at the meetings indicated that in Greater

Figure 3: *Number of elderly 85+ per 100 caregivers age 45-64 in Minnesota and selected counties in 2000 and 2030.*



Source: Minnesota State Demographers Office, 2004.

Minnesota, frail seniors tend not to "fall through the cracks," and that their care needs are known and acted upon. In addition to the informal network, non-profit organizations, community organizations and faith communities also provide volunteer-based care such as home delivered meals, transportation and companion services, which are important to maintain seniors in their homes.

"Caregiver ratios" have been used to measure the level of the availability of caregivers now and in the future throughout Minnesota. This ratio compares the number of persons 85+ to the number of females age 45-64 (the most likely caregivers of frail elderly) at the state level and in each county. These ratios are far higher in the Greater Minnesota counties of the state now and are expected to increase even more by 2030. Figure 3 shows what these caregiver ratios look like in some selected counties in Greater Minnesota and urban Minnesota in 2000 and 2030. (For the purpose of this analysis, caregivers are defined as females ages 45-64 because the majority of caregivers are females in this age range. This is gradually shifting somewhat, as men increase their elder caregiving responsibilities. Some experts estimate that 20% of services to older relatives are provided by men.)

4. Most of Minnesota's communities are not adequately prepared for major increases in their older residents, and more work is needed to make them good places to grow old.

An increasing number of the residents of the state's communities are over age 65, especially in our small towns. For example, in Fertile, Minn., a small town of 900 in northwestern Minnesota, 50% of the households are over age 65. Participants at the meetings indicated that many communities in the western and southern areas of the state are like Fertile and have a "2030" population right now. As more communities face these demographics, they will need assistance to maintain or develop components that provide support to all residents including their older residents.

The presence of older adults is a tremendous resource for communities, since it provides additional workers, volunteers, leaders to serve in civic positions and caregivers for the more frail elderly. In addition, the goods and services purchased by older persons — groceries, prescription drugs, housing, health services, nursing homes — are critical to the economy and vitality of many communities. Participants described in detail dozens of components of the ideal community that supports its residents, e.g., transportation, housing options and services, volunteer sources of support, ways to connect all generations, community design features

that make the community accessible to those with hearing, visual, or physical disabilities, an array of health and support services, opportunities for volunteering and civic engagement, and more senior-friendly businesses. However, as communities age, it can be more difficult for them to financially support these components.

Current and future housing for the elderly was a big topic. Some commented that the current housing stock is nearly all single-family homes in Greater Minnesota, and much of it is not accessible for persons as they age. Either home modifications need to be more accessible and available from trustworthy sources with the needed expertise, or older people will not be able to remain in their homes as they age.

Many excellent efforts to create age-friendly communities are under way across the state, but the participants felt a more coordinated and comprehensive approach is needed to achieve the goal of livable communities in all parts of the state.

5. **The health and long-term care systems in Greater Minnesota are not adequate to provide the type and amount of care needed by a population growing older.**

Participants at the meetings identified many problems in the current health and long-term care systems. The use of an acute medical model instead of a chronic care model results in fragmented, episodic care. Continuity of care and access to the range of providers needed is difficult in Greater Minnesota due to population declines, consolidations and closures of hospitals to a certain extent, but more so of nursing homes. These closures have had other effects as well. Longer and more frequent drive times are required to see providers, putting increased pressure on families, volunteer drivers and public transportation programs. In addition, the role that managed care is assuming to serve publicly funded older clients is causing shifts in historical roles of counties, providers and health plans.

6. **A significant proportion of the current long-term care work force in Greater Minnesota areas is nearing retirement, and action is needed to recruit and retain their replacements.**

Trends are in place that will shrink the long-term care work force at the very time that the need for long-term care will be increasing. Participants spoke of a number of social and economic factors that contribute to the continuing shortage of workers: low wages and lack of affordable retirement and health insurance benefits, physical stress and strain, emphasis by schools on computer or business careers rather than health and long-term care occupations, and lack of status

associated with these types of jobs. Given these factors, the industry is not attracting the number of young or new workers needed to replace those who will begin retiring soon.

These labor force issues are clearly more acute in Greater Minnesota areas. The population base in Greater Minnesota areas is declining and is not expected to grow in the future. Many experts cite low wages as the most significant factor in the continuing out migration of younger persons. As a result, Greater Minnesota communities have fewer professionals available to provide care for older residents.

7. Minnesota's long-term care reform efforts must be intensified so that a broader menu of long-term care options is available in Greater Minnesota.

Participants at the meetings agreed that there has been and will continue to be dramatic change in how long-term care is provided. The vast majority of elderly want to age in place and remain in their homes and communities as long as possible with the supports they choose to help them stay there. At the same time, providers face ongoing challenges in providing an adequate array of home care services. While the supply of services is growing, many communities still do not have enough affordable services to meet current needs, much less meet the increased demand as the older population increases.

The long-term care system in Greater Minnesota areas often includes few choices in home and community-based services including home care, affordable assisted living, and basic supports such as transportation, chore services and respite. Participants at the meetings reported that the number of home care agencies continues to shrink and there are counties with no private home care providers. In these situations county public health agencies find that they are needed to deliver home care services directly rather than performing their strategic roles in education and prevention. Many of the long-term care service gaps in Greater Minnesota areas stem from the expense of delivering services across long distances and the inability to capture economies of scale.

Transportation is universally noted as a service gap in Greater Minnesota areas and one that often needs to be addressed through multi-county, regional efforts. The issues in transportation include availability, access, fragmentation, geographic boundaries, need for an escort component, and Greater Minnesota residents needing to get "to town" to catch the bus. Volunteer driver programs are available, but they are often unable to meet all the need and also face

liability issues. The informal network of family and friends — often seniors themselves — is the primary foundation for meeting seniors' transportation needs in Greater Minnesota areas.

The current and future status of Minnesota's nursing homes was a hot topic at the meetings. Those within the nursing home industry described major shifts in the numbers and types of individuals served in their facilities: many of those now served need post-acute rehab, complex medical management that used to be provided in hospitals, or have severe dementia requiring close supervision and care. Less disabled elderly are staying in their homes or moving to assisted living facilities. In the past ten years, nearly 10,000 beds have closed statewide, and predictions were made at the meetings that more would close. Many participants commented on the important economic role that nursing homes play in their small communities, often as a major employer, and the importance of keeping the long-term care expertise of these local providers, even as downsizing of the industry continues.

Due to the lack of in-home services, and because of long-standing community practices, nursing homes in some Greater Minnesota communities are sometimes used as housing options. Greater Minnesota residents are concerned about intentionally decreasing the supply of nursing home beds, fearing that these actions will harm their community's economic vitality or that there will not be a nursing home bed available for them if they need one in the future. There is agreement that there may be excess nursing home beds, but there are not enough home and community-based services to replace the care provided by these nursing home beds and facilities.

8. The older population within ethnic, immigrant and tribal communities is growing in Greater Minnesota, and the long-term care systems are not prepared to meet their special needs.

Meetings with representatives from the state's American Indian tribal organizations identified the many challenges that American Indian elders have in their lives, their families and their communities, ranging from poverty to health concerns, to concerns about the youth in their communities. The gaps in service that exist in Greater Minnesota areas are even larger on many reservations, especially those in the northern areas of the state. Participants also mentioned the effects of major cutbacks in federal Indian Health Services funds. A very high number of American Indian children are being raised by their grandparents because their parents are unable to do so. With all of the critical issues facing their communities now,

it is difficult for the elders to have a normal retirement.

The representatives attending the meetings to discuss the needs and issues of ethnic and immigrant elders spoke of the challenges facing their communities, also. Younger members of these groups experience the tension between obligations to care for elders and the reality of getting ahead in our society, which requires many hours of work and leaves little time for eldercare. Social isolation is a reality for many immigrant elders and leads to physical and mental health issues. Because of the lack of services, family members are called upon to be interpreters, caregivers, and transportation providers, as well as providers of social support.

Participants drew a distinction between the assistance that immigrant elders need as they arrive in this country, and retirement income, health care, housing and other supports that *all* elders need. They stressed the need to emphasize the similarities rather than the differences among elders and advocate for strong income, health and housing programs for *all* older people.

Long-Term Care Reform in Greater Minnesota

In 2001, the recommendations of a state legislative task force on long-term care were enacted, resulting in the most comprehensive long-term care reform in Minnesota in many years. The reform called for policy action in six areas intended to beef up the state's long-term care system and reduce our reliance on the institutional model of care, a model that is growing less attractive to new generations of older persons and is also the most expensive form of care. These policy directions provide a framework to assess how these reform efforts have worked and how they have affected long-term care in Greater Minnesota.

1. Maximize peoples' ability to meet their own long-term care needs. *This policy direction emphasizes the importance of the role of information and assistance to increasing awareness about what services are available to meet long-term care needs, the need to expand the private financing options available to individuals to pay for long-term care, and the use of technology to meet long-term care needs.*

Since 2001, much effort has gone into expanding and improving the Minnesota Board on Aging Senior LinkAge Line, a telephone information and assistance service operated by the regional Area Agencies on Aging around the state. Specially trained staff is now available in each of these offices, and expanded visibility is increasing the number of calls each year. In terms of technology, a growing number of providers are using telehealth to connect

rural elders with health services. These projects have been readily accepted by seniors and make best use of limited health and long-term care staff resources in Greater Minnesota by reducing time that used to be used for travel. Health monitoring services, which check vital signs and provide a daily reassurance for elders with chronic conditions, are being provided to a growing number of seniors in Greater Minnesota with excellent results. Increasing use of video and web-based technology could play a major role in meeting the future health and long-term care needs in Greater Minnesota.

2. Expand the capacity of community long-term care system. *To be able to reduce the state's reliance on the institutional model of long-term care, the supply of community based services needs to be expanded in all parts of the state so options are truly available to all elderly. Communities also need to be more age-friendly so they can support their older residents as they age in place.*

One of the major provisions passed in 2001 to address this policy direction was the Community Service/Service Development Grant program (CS/SD). This state grant program, administered by the Minnesota Department of Human Services, has been used to implement strategies for long-term care reform by providing seed money to develop new capacity within the home and community-based service system and to help "redesign" existing services to make them more cost-effective and fiscally sustainable into the future. Over $27 million in grant funds have been awarded to more than 200 CS/SD projects in 82 counties across Minnesota in the past five years. The grant staff estimates that two-thirds of these funds have been awarded to projects serving Greater Minnesota. These projects have:

- Expanded home and community-based services to over 90,000 persons.
- Increased the number of volunteers providing services by more than 18,000 (with significant growth occurring in community support, transportation and caregiver support services, areas identified as gaps through a statewide "service gaps analysis" completed by counties in 2001, 2003, and 2005).
- Helped to build or renovate over 890 units of affordable senior housing.

CS/SD funds have also increased program sustainability. Over 91% of funded projects continued to provide services after the grant

ended; 7,000 additional older persons eligible for public long-term care services have been served in the community; 8,239 persons have paid for services based on a sliding fee scale; and 18,000 persons have paid for services on a private pay basis or through third-party payers.

3. Reduce our reliance on the institutional model of long-term care. *This policy direction focused not only on reducing nursing home capacity but also transforming and strengthening the remaining nursing homes to better serve those consumers who need more rehab, medical management or long-term dementia care.*

Since 2001, when the state enacted major long-term care reform, the number of nursing home beds throughout the state has declined steeply. The number of beds has actually been declining since 1987, when the state had 48,307 beds, an all-time high. Since then, 57 facilities and 9,538 beds have been closed, with an additional 1,587 beds taken out of active status and put in layaway status. As of 2005, Minnesota had 411 facilities with a total of 37,182 beds in active service. Most of this reduction was completed under the voluntary planned closure provision included in the comprehensive long-term care reform legislation in 2001. An estimated 4,500 of the beds closed were located in Greater Minnesota. However, most of these closures have been partial closures, where beds have been reduced but the facilities have remained open.

The ratio of nursing home beds per 1,000 elderly persons is generally higher in Greater Minnesota counties than in urban counties. Figure 4 illustrates the wide variation in this ratio across selected counties in various parts of Greater Minnesota compared to urban counties. There are several possible explanations for these higher ratios.

First, many feel that the limited availability of a broad range of home and community-based options for older persons in Greater Minnesota forces a greater use of nursing homes for care that could be provided in the home if services were available. Even with the expansion that has occurred in the past five years, the most recent county level "gaps analysis" completed by county staff working in aging services indicated that many counties still reported significant gaps in home and community-based services for the frail elderly *(Transform 2010 regional profiles, 2006)*.

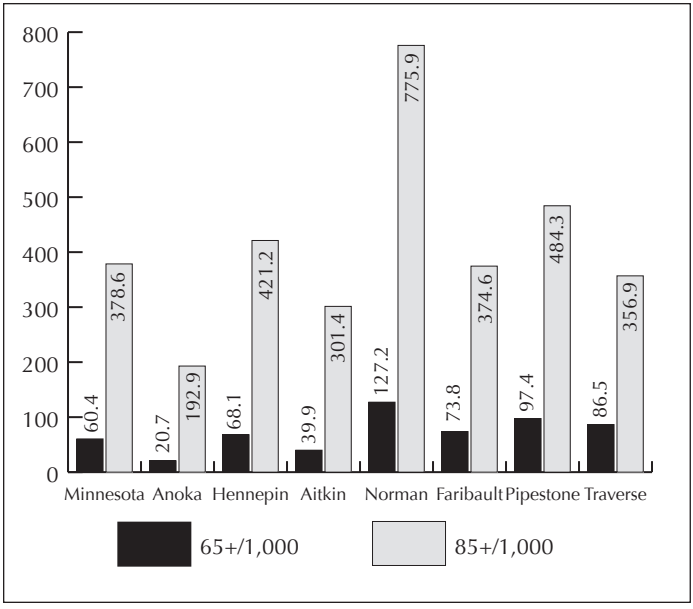
Second, the informal network plays a critical role in the use of congregate settings by the elderly in Greater Minnesota areas. Because of gaps in formal services, families and friends are called upon to fill more of the care needs themselves and at some point

cannot continue this role. Once they can no longer provide the increasing amounts of care needed, the older person cannot remain in their home, and a move to a congregate setting becomes the only care option available. Thus, the use of senior housing, assisted living and nursing homes — in other words, all current versions of congregate settings for elderly — tends to be high in Greater Minnesota.

Third, the long distances that must be traveled by family members or staff from provider agencies limits the efficiency of the home care model for elderly who need multiple services. Many providers and families also point out the social isolation that can occur when frail elderly are "independent" in their homes but unable to get out socially and do not have lots of visitors or contacts within their home or community. Many feel that a congregate setting fills the need for a more packaged set of services and reduces the social isolation factors.

Another provision in the 2001 legislation that has affected the nursing home industry both in urban and Greater Minnesota has been the effort to improve the reimbursement system for nursing homes. A number of options have been studied since 2001 to find a better method for setting rates and paying for nursing home care. In

Figure 4: *Nursing facility beds per 1,000 65+ and 85+ persons in Minnesota and selected counties, 2005.*



2005, the legislature enacted a first step in "Pay For Performance" for nursing homes. This effort provides a quality add-on to the payment rate. Based on quality scores, facilities will receive increases as large as 2.4% of their operating payment rates effective October 1, 2006. The quality score is based upon measures included in the nursing home report card (see section 4 below). This will affect individual facilities throughout the state.

4. Align systems to support high quality and good outcomes. *The focus of this policy direction is to ensure that adequate quality information is collected and available to help consumers make decisions on specific care settings or facilities.*

After a number of years of development, in early 2006, the Minnesota departments of Health and Human Services published the first nursing home report card. It is web-based and allows the user to select the quality measure they consider most important, providing scores on eight quality measures using a five star rating. All nursing facilities throughout the state (except for veterans and state-operated homes) are included in this report card.

5. Support the informal network of families, friends and neighbors. *The emphasis of this policy direction is on widening and strengthening the supports available to informal caregivers who provide the vast majority of assistance to the frail elderly in the state.*

The 2001 long-term care legislation called for expanding the menu of respite and other support services in all parts of the state and making these services more affordable to caregivers. Since that time, counties have expanded the caregiver services they provide within their Elderly Waiver and Alternative Care programs. More services for caregivers are also now available through the state's Area Agencies on Aging. They have used their available federal Older Americans Act fund to provide additional caregiver services. In addition, the CS/SD grant program described earlier is funding 30 projects serving nearly 7,000 persons with caregiver support, caregiver coach and respite services. A total of 24 of these projects have been funded within Greater Minnesota.

6. Recruit and retain a stable long-term care work force. *It is essential that steps are taken to recruit, retain and support an adequate work force for health and long-term care services.*

The 2001 long-term care reform legislation emphasized a number of actions that were necessary to attract and retain long-term care workers. The legislation called for adding a cost of living adjustment

to the rates of all long-term care providers reimbursed through state-funded programs and studying ways to cover more direct-care workers with health insurance.

Also included was expansion of tuition credits, loan forgiveness options, and additional efforts through MnSCU and the Healthcare Education - Industry Partnership (HEIP) to improve and expand training for direct-care workers. Internship programs for middle and high school students to work in health and long-term care settings were also expanded through this legislation. These additional efforts joined an already wide array of loan forgiveness programs available through the Department of Health to provide incentives for health and long-term care workers to work in underserved areas of the state.

Who is Working to Improve Rural Long-Term Care?

A number of agencies and organizations are working with local communities and groups to further develop the long-term care system for older persons in Greater Minnesota.

Minnesota Department of Health (MDH). The Office of Rural Health and Primary Care within the Minnesota Department of Health has as one of its priorities the special needs of the elderly in Greater Minnesota. It began a major initiative in 2005 to identify the needs of Greater Minnesota elders and define the elements of healthy communities where older residents can successfully age in their home communities. This work is summarized in a number of reports and documents available on the Health Department website at www.health.state.mn.us.

The health department is also partnering with the Minnesota Department of Human Services and the Minnesota Board on Aging on a major project called Transform 2010, which is identifying the impact of the permanent shift in the age of the state's population and developing a strategic plan for what needs to be done to prepare Minnesota for the "age wave."

The Minnesota Board on Aging (MBA). The MBA is another agency whose priorities include efforts to address the needs of the elderly in Greater Minnesota. It is a governor-appointed board, designated as the "State Unit on Aging" under the federal Older Americans Act. As the State Unit on Aging, the Board has the federal mandate to develop a comprehensive, coordinated system of services for persons 60 and over within Minnesota. The federal legislation includes a long list of mandated activities such as providing

information and assistance, operating an ombudsman service for older Minnesotans, and administering about $21 million in federal Older Americans Act funds available to fund supportive services at the community level, e.g., chore, transportation, caregiver respite, nutrition services, etc.

Area Agencies on Aging and Eldercare Development Partnerships. The MBA funds and oversees a network of regional Area Agencies on Aging (AAAs) and Eldercare Development Partnerships (EDPs) that provide system and service development in their regions. (All but one of the seven EDPs are organizationally part of AAAs.) Because they are organized at the regional level, six of the seven Area Agencies and EDPs serve Greater Minnesota. Hence, their service development and funding efforts focus on developing or expanding services to meet the long-term care needs of older persons in rural areas.

Minnesota's network of AAAs is mandated to develop home and community services, including senior nutrition programs, senior centers, transportation, chore, respite, information and advocacy, and health promotion programs. Each office also operates the Senior LinkAge Line, a telephone information and assistance service backed up with an extensive web-based database of programs and resources available to older persons and their families. Currently, one of their main priorities (within their contracts with MBA) is the development of local linkages between acute care providers and community-based supports in an effort to improve chronic care management and reduce preventable use of hospitals by frail elderly.

The EDPs provide targeted technical assistance to counties, local communities and service providers, with a focus on creating new services and redesigning existing services to improve quality and sustainability. Most of their technical assistance occurs in two areas: 1) best practices for use of public and private resources to meet new needs and priorities; and 2) assistance in making needed changes, e.g., providing business plan expertise, convening and developing new partnerships, and technical assistance to those seeking state grant sources. Filling gaps in local long-term care systems is a major role in the work of EDPs as well as AAAs.

Minnesota Department of Human Services (DHS). DHS administers a number of programs that benefit older persons in Greater Minnesota. Through its Health Care Administration, it contracts with nine health plans to provide an integrated package of acute, primary and long-term care services to elderly who are

eligible for Medical Assistance because of their low income and need help paying for their health and long-term care. Currently, over 30,000 seniors are served in this program, most through a program called Minnesota Senior Health Options. Other health care programs available to older persons throughout the state include Medicare-related services, such as assistance with Medicare premiums, deductibles, coinsurance and copays for certain Medicare enrollees.

DHS also supervises the provision of long-term care services through counties, including Long-Term Care Consultation services that help elderly of any income with assessing their needs for long-term care and developing plans for how to meet their needs; the Elderly Waiver services for low-income elderly eligible for Medical Assistance and at risk of nursing home placement but not served through health plans; the Alternative Care programs for elderly who are at risk of nursing home placement but are not eligible for Medical Assistance; and adult protective services for vulnerable adults including the elderly. (More detail on these programs can be found on the DHS website at www.dhs.state.mn.us/aging, and click on "reports and publications" and then "fact sheets.")

DHS is a leader in the Transform 2010 effort. Along with MDH and MBA, DHS is working on a number of steps including completion of a strategic vision for the state on what needs to happen to prepare all sectors for a permanent shift in the age of our state's population.

Counties. Counties provide critical services and functions that support long-term care systems in Greater Minnesota. Through their public health and social service departments, counties provide health promotion and education, home care, adult protection services, long-term care consultation and related assessment, care planning and monitoring, although some of these functions are changing as the EW services are transferred to the health plans and Alternative Care services. Some counties continue to provide some EW and related services under contract with local health plans. Many counties have developed and continue to fund other essential services such as transportation, volunteer services, chore or housing related services, affordable senior housing through county housing redevelopment authorities, and a variety of health and social supportive services. Some counties are also working with local communities to make them more age-friendly for their older residents.

Counties will continue to be a key local resource in the development and provision of services to their older residents as the older population grows and changes over the next 25 years.

Local communities and service providers. Local communities and health, housing, aging and long-term care providers in those communities are playing a key role in developing responses to the growing elderly populations in their areas. The long list of CS/SD projects developed by local providers and funded in Greater Minnesota is testimony to the creative and innovative models being developed by local organizations to better serve their frail elderly population.

Conclusion

Long-term care for the elderly is a critical issue in Greater Minnesota and its importance will grow as the population continues to age. State and local groups are working together to develop and test new approaches to address these needs. The results of their efforts will help all of Minnesota face the long-term care challenges of the future.

References

Kane, Rosalie, Kane, Robert, Ladd, Richard. (1998). *The Heart of Long-Term Care.* New York: Oxford University Press.

Minnesota Board on Aging. (2005). *The Survey of Older Minnesotans. Data Tables.* http:/ www.mnaging.org/Survey of older Minnesotans. Author: same.

Department of Human Services. (2006). *Transform 2010 Regional Profiles.* www.dhs.state.mn.us/main/dhs_id_056778.doc Author: same.

Minnesota Board on Aging. (2006). *Legislative Priorities 2007. Aging in Minnesota: Critical Changes Ahead."* Author: same.

Minnesota Department of Health. Minnesota Office of Rural Health and Primary Care and the Minnesota Center for Health Statistics. (June 2005). *Health and Well-Being of Rural Minnesotans: A Minnesota Rural Health Status Report*. Author: same.

Minnesota Department of Human Services. (April 2006). *Summary of Transform 2010 Meetings.* . www.dhs.state.mn.us/main/dhs_id_057946.doc Author: same

Minnesota Department of Human Services. 2006. *Status of Long-Term Care in Minnesota: 2005: A Report to the Minnesota Legislature*. www.dhs.state.mn.us/main/dhs_id_059536.pdf Author: same.

Measuring and Improving the Quality of Care in Rural Minnesota Hospitals

Michelle M. Casey

Beginning with a brief overview of national health care quality improvement efforts, this article describes national initiatives to improve the quality of care and patient safety, along with the challenges of measuring quality of care in rural settings. Next, the article analyzes the performance of rural Minnesota hospitals in the Hospital Compare and Leapfrog initiatives and compares the results of national and Minnesota surveys regarding medication safety practices in small rural hospitals. The article concludes by suggesting ways rural Minnesota hospitals can continue to improve quality of care.

What is "Quality of Care"?

Quality health care is defined by the Agency for Healthcare Quality and Research as doing the right thing, at the right time, in the right way, for the right person — and having the best possible results. This means that patients receive the appropriate services they need to help them stay healthy and recover from illness and do not receive unnecessary tests or procedures.

There are many different ways to measure health care quality. Traditionally, three types of measures have been used to evaluate the quality of health care: structure, process and outcome. *Structural measures* address the characteristics of health care providers and facilities that are expected to influence the quality of care provided, such as the qualifications of medical staff and whether a hospital is accredited. *Process measures* focus on the type of care that is provided and how it is provided: for example, whether a child receives a recommended immunization on schedule or a patient with diabetes receives an annual eye exam. *Outcome measures* address the impact of care on the patient. Examples may include whether a patient survives or recovers the ability to take care of himself or herself.

Data to assess quality of care can come from a variety of sources, including patient medical records, Medicare and private insurer billing data, and patient surveys.

Increasingly, structural measures have been considered necessary but not a sufficient means of assuring health care quality. Although outcome measures are the most direct way of measuring quality, their use is complicated because factors other than the care provided can affect patient outcomes. Patient characteristics such as age, chronic health problems and other pre-existing conditions may all influence the effectiveness of the treatment and therefore the outcome. In addition, the outcomes of some types of preventive care cannot be measured until several years have passed. For these reasons, many of the most recent efforts to evaluate the quality of health care have focused on process measures. These measures are based on evidence in scientific literature regarding the relationships between specific treatments and patient outcomes, as well as expert opinion.

National Quality Performance Measurement and Improvement Efforts

Setting standards at the national level. The Institute of Medicine's 2001 report, *Crossing the Quality Chasm,* defined quality health care as care that is effective, safe, timely, patient-centered, equitable and efficient, establishing priorities for improvement of the nation's health care system (IOM, 2001). A subsequent IOM report published in 2005, *Quality through Collaboration: The Future of Rural Health*, built on the previous IOM work to address quality of care issues in rural America. The IOM rural report recommended adoption of a comprehensive approach to quality improvement in rural areas that encompasses clinical knowledge and the tools to apply this knowledge to practice, standardized performance measures, performance measurement and data feedback, and quality improvement processes and resources (IOM, 2005).

Public and private sector health care organizations have implemented several national initiatives focused on performance measurement and quality improvement in recent years. These initiatives have multiple purposes. Within a health care organization, assessment of organizational performance can help inform and motivate internal activities to improve the quality of care. Sharing data on standardized quality measures allows health care organizations to benchmark with their peers, and public reporting of comparative information can be used to improve purchaser and

consumer decision making about where to get the best care.

Many organizations at the national level have implemented some type of quality of care measures:

- The Joint Commission on Accreditation of Health Care Organizations (JCAHO), the private non-profit organization that accredits the majority of hospitals, has incorporated quality measures in the accreditation process.
- The Hospital Quality Alliance (HQA) was established by a coalition of hospital associations and other private and public organizations to encourage voluntary public reporting of hospital quality information.
- The Center for Medicare and Medicaid Services (CMS), which administers the Medicare and Medicaid programs on the federal level, has implemented public reporting of quality measures for hospitals, nursing homes, and home health agencies and has begun a voluntary reporting effort focused on physicians.
- The National Quality Forum (NQF), a public-private partnership that includes purchasers, employers, health care professionals and other organizations, endorses national consensus standards for measuring and publicly reporting on performance.
- The Leapfrog Group, a purchaser coalition, helps its employer-members provide incentives and rewards to hospitals that improve the quality of the care provided to patients by implementing Leapfrog's quality and safety practices, which are known as "leaps."

To help minimize confusion and duplication of efforts and reduce the reporting burden on health care organizations, representatives of several national organizations have worked to standardize quality measures. HQA, JCAHO, and CMS have agreed on a set of hospital quality measures that reflect evidence-based treatment for heart attack (acute myocardial infarction), heart failure, pneumonia, and surgical infection prevention (CMS, 2005). These conditions are common reasons for hospitalization, especially among Medicare beneficiaries. The measures, endorsed by the National Quality Forum, are being used for multiple purposes, including accreditation and public reporting. NQF also has endorsed a set of 30 safe practices for implementation by hospitals. Leapfrog adopted three of these practices as its first three "leaps" and the remaining 27 practices as the fourth "leap."

Measuring Quality of Health Care in Rural Environments

Although many issues related to improving health care quality are common to both urban and rural areas, a number of quality measurement issues are specific to rural health care systems. Rural hospitals tend to be smaller organizations with lower patient volume and to provide fewer specialized services than urban hospitals. They are also more likely to have limited resources available in terms of staffing and technology, and to transfer a higher percentage of patients with certain conditions (e.g., heart attacks) to larger facilities.

These organizational differences have implications for the relevance of quality measures for rural hospitals and measurement reliability (Moscovice, Wholey, Klingner et. al., 2004). Some quality measures developed for larger urban hospitals are not relevant for rural hospitals because, for example, they address procedures that are not usually performed in rural hospitals. At the same time, additional quality measures are needed to address processes that are especially important in rural hospitals, such as triage, stabilization and transfer of patients. Also, low patient volumes in many rural hospitals make it more difficult to obtain reliable rates for some quality measures, especially those focused on specific conditions or procedures.

Hospital Compare reporting requirements. To make quality measure data more accessible to the public, the Medicare Prescription Drug, Improvement and Modernization Act of 2003 required eligible acute care hospitals paid under the Prospective Payment System (PPS)[1] to report data to CMS on the initial ten quality measures adopted by the Hospital Quality Alliance, beginning with 2004 discharges.[2] Hospitals could also report data on additional measures if they chose. The data was then reported on Hospital Compare, a website set up by CMS to provide public access to the quality data. Hospitals that did not report the required data faced a reduction in their Medicare annual payment update, starting in fiscal year 2006. Subsequently, the Deficit Reduction Act of 2005 required PPS hospitals to report data on a total of 21 measures beginning in fiscal year 2007 and further reduced the payment update for hospitals that declined to provide data or failed the data submission requirements.

The CMS reporting requirement does not apply to Critical Access Hospitals (CAHs), which receive cost-based reimbursement from Medicare, rather than payments via the PPS system. As of October 2006, a total of 1,284 hospitals nationally were certified

as CAHs; Minnesota has the third highest number of CAHs in the nation (Flex Monitoring Team, 2006a). CAHs must be located in a rural area or an area defined as rural by federal Medicare regulations governing CAH designation and either located at a certain distance from another hospital or certified by the state as a necessary provider of health care services. They are limited to a maximum of 25 beds and must maintain an annual average length of stay of 96 hours or less for their acute care patients. Although participation in Hospital Compare is voluntary for CAHs, it provides an important opportunity for CAHs to assess and improve their performance on national standards of care, and many CAHs are voluntarily submitting data.

Hospital Compare quality measures. Figure 1 lists the 21 quality measures currently in the Hospital Compare dataset, including the initial ten measures PPS hospitals were required to report to CMS for 2004 and 2005 discharges. The initial ten-measure set included five measures for heart attack patients: aspirin at arrival, aspirin at discharge, beta blocker at arrival, beta blocker at discharge and ACE inhibitors for left ventricular systolic dysfunction (LVSD). The ACE inhibitor measure was subsequently revised to include angiotensin receptor blockers (ARBs); both are medications used to treat heart attacks, heart failure, or a decreased function of the heart. Beta blockers are medications used to lower blood pressure, treat chest pain and heart failure, and to help prevent a heart attack.

Two measures for heart failure patients were in the initial set: assessment of left ventricular function (LVF), which checks how the left chamber of the heart is pumping, and prescription of ACE inhibitor (or later ARB) for LVSD. Small rural hospitals are much less likely to have the echocardiography or cardiac catheterization facilities needed to assess LVF. However, the measure counts a patient in the numerator if the hospital record documents that LVF was evaluated before arrival, during hospitalization, or is planned for after discharge. Three pneumonia measures were also in the initial measure set: oxygenation assessment, pneumococcal vaccination status, and whether the initial antibiotic was received within four hours.

The additional measures for which hospitals could voluntarily report data for 2004 and 2005 discharges include three measures related to the provision of smoking cessation advice for patients hospitalized for a heart attack, heart failure, or pneumonia, who had a history of smoking. Additional heart attack measures address the timing for provision of thrombolytic drugs used to break up

Figure 1: *Hospital Compare measures for heart attack, heart failure, pneumonia and surgical infection prevention.*

Heart attack/acute myocardial infarction (AMI) Measures
Aspirin at arrival: AMI patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival.*
Aspirin at discharge: AMI patients without aspirin contraindications who were prescribed aspirin at hospital discharge.*
ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD): AMI patients with LVSD and without angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker (ARB) contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.*
Beta Blocker at arrival: AMI patients without beta-blocker contraindications who received a beta-blocker within 24 hours after hospital arrival.*
Beta Blocker at discharge: AMI patients without beta-blocker contraindications who were prescribed a beta-blocker at hospital discharge.*
Thrombolytic agent received within 30 minutes of hospital arrival: AMI patients receiving thrombolytic therapy during the hospital stay and having a time from hospital arrival to thrombolysis of 30 minutes or less.
PCI received within 120 minutes of hospital arrival: AMI patients receiving Percutaneous Coronary Intervention (PCI) during the hospital stay with a time from hospital arrival to PCI of 120 minutes or less (This measure was initially within 90 minutes).
Smoking cessation advice/counseling: AMI patients with a history of smoking cigarettes who are given smoking cessation advice or counseling during a hospital stay.
Heart Failure Measures
Assessment of left ventricular function (LVF): Heart failure patients with documentation in the hospital record that LVF was assessed before arrival, during hospitalization, or is planned for after discharge.*
ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD): Heart failure patients with LVSD and without ACE inhibitor or ARB contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.*
Discharge instructions: Heart failure patients discharged home with written instructions or educational material given to patient or caregiver at discharge or during the hospital stay addressing activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.

Smoking cessation advice/counseling: Heart failure patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.
Pneumonia Measures
Initial Antibiotic Timing: Pneumonia inpatients that receive within 4 hours after arrival at the hospital.*
Pneumococcal Vaccination Status: Pneumonia inpatients age 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated.*
Oxygenation Assessment: Pneumonia inpatients who receive an oxygenation assessment, arterial blood gas, or pulse oximetry within 24 hours of hospital arrival.*
Blood culture performed prior to first antibiotic received in hospital: Pneumonia patients whose initial hospital blood culture specimen was collected prior to first hospital dose of antibiotics.
Smoking cessation advice/counseling: Pneumonia patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.
Appropriate Initial Antibiotic Selection: Immunocompetent patients with pneumonia who receive an initial antibiotic regimen that is consistent with current guidelines.
Influenza Vaccination Status: Pneumonia patients age 50 years and older, hospitalized during October through February who were screened for influenza vaccine status and vaccinated prior to discharge, if indicated.
Surgical Infection Prevention Measures
Prophylactic Antibiotic Received Within 1 Hour Prior to Surgical Incision: Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision.
Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time: Surgical patients whose prophylactic antibiotics were discontinued within 24 hours after surgery end time.

** Measures that were part of the initial 10 measure set for public reporting.*
Source: CMS, 2006.

or dissolve blood clots, and of percutaneous coronary intervention (PCI) procedures, which open blocked blood vessels. PCI procedures require specialized equipment and cardiology expertise that are not present in many rural hospitals. An additional heart failure measure assesses whether a patient or caregiver was given instructions at discharge or during the hospital stay that addressed activity

level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen. Additional pneumonia measures assess whether a patient had a blood culture performed before the first antibiotic was received in the hospital, and the appropriateness of the initial antibiotic selection. Implementation of another pneumonia measure, influenza vaccination, was delayed due to vaccine shortages, but was added to the list of measures in 2006. The surgical infection prevention measures assess the provision and timing of antibiotics prior to surgery and their discontinuation after surgery. These measures apply to selected surgeries; some (e.g., hysterectomies) are more commonly provided in rural hospitals than others (e.g., cardiac procedures).

The goal for each Hospital Compare measure is to have 100% of eligible patients receive the treatment. The measures exclude patients who have contraindications to receiving the treatment. For example, aspirin would not be given to patients who are allergic to aspirin or are taking anticoagulant medication. Patients who are transferred to another hospital or transferred from another hospital also are not included in the population for several measures. To report the measures, hospitals collect data from patient medical records and submit it to the Quality Improvement Organization (QIO) Data Warehouse. Data submissions are subject to auditing procedures, edit checks and validation by CMS.

In 2003-2004, the University of Minnesota Rural Health Research Center evaluated the relevance of existing national and state quality measures for rural hospitals with fewer than 50 beds (Moscovice et. al., 2004). The measures identified as relevant for small rural hospitals included the initial ten Hospital Compare measures for heart attack, heart failure, and pneumonia, as well as an additional surgical infection prevention measure that is similar to the Hospital Compare surgical infection prevention measures. Additional quality measures were also developed or adapted to address small rural hospital Emergency Department timeliness of care and transfer communications. These measures have been field tested in small rural hospitals in Minnesota, Nevada and Utah in collaboration with the QIOs for those states, and in Washington working with the Washington State Rural Healthcare Quality Network.

Defining Minnesota's rural hospitals. Minnesota currently has 135 acute care hospitals (not including federal Veterans Administration and Indian Health Service facilities or state operated treatment centers). For this article, rural hospitals were defined as hospitals located in Minnesota's 66 non-metropolitan counties as well as

Table 1: *Participation of Minnesota Critical Access Hospitals and rural non-CAHs in Hospital Compare.*

	2005	2006
Critical Access Hospitals	17 (24%)	44 (55%)
Rural Non-CAH Hospitals	34 (100%)	21[1] (100%)

[1]*Includes one Indian Health Service hospital.*
Data sources: Centers for Medicare and Medicaid Services' Hospital Compare data for January – December 2004 (as of September 2005) and January – December 2005 inpatient hospital discharges (as of September 2006); Flex Monitoring Team CAH List, 2006.

hospitals that are certified by Medicare as critical access hospitals. A total of 100 hospitals meet these criteria: 20 hospitals not designated as CAHs that are located in non-metropolitan counties and 80 CAHs. (Fourteen Minnesota CAHs are located in metropolitan counties, but are considered rural under Federal CAH regulations.)

Results: A Look at Various Quality of Care Measurements

Health Care Quality in Minnesota. Overall, Minnesota ranks high on state-by-state comparisons of health care quality. In a national assessment of the quality of care provided to Medicare beneficiaries, Minnesota ranked seventh among 50 states plus the District of Columbia and Puerto Rico in 1998-99 and tenth in 2000-2001 (Jenks, Huff & Cuerdon, 2003). On 15 measures of health care quality in the Agency for Healthcare Quality and Research's 2005 National Healthcare Quality Report, Minnesota ranked in the top ten states for six measures and in the top 20 states for an additional six measures (AHRQ, 2005). These national data are not reported separately for rural and urban populations, however. At the state level, Minnesota health plans and providers report data on a number of different quality measures, but these data are not usually reported separately for rural and urban populations either. Therefore, this article instead focuses on Hospital Compare and Leapfrog Group data, which are available at the hospital level.

Hospital Compare Results for Rural Minnesota Hospitals. All rural non-CAH hospitals in Minnesota that were required to participate in Hospital Compare to receive their full Medicare payment update submitted data on quality measures for 2004 and 2005 inpatient discharges (Table 1). (The number of rural non-CAH hospitals decreased and the number of CAHs increased during this time

period because of CAH conversions.) Although they were not required to, 17 Minnesota CAHs participated in Hospital Compare in 2005 and 44 participated in 2006 (participation is defined as submitting data on at least one quality measure for discharges in the previous year). The Minnesota CAH participation rate of 24% for 2005 was lower than the national CAH participation rate of 41%, but increased considerably in 2006 with 55% of Minnesota CAHs participating, compared to 53% of CAHs nationally.

Table 2 compares the percent of patients receiving recommended care for heart attack, heart failure and pneumonia in CAHs and other rural hospitals in Minnesota to national percentages using quality measure data for 2004 discharges reported to Hospital Compare. For each measure, the percentage of patients in CAHs and in other rural hospitals that received the recommended care were calculated by dividing the total number of patients in all hospitals in the group who received the recommended care by the total number of eligible patients for each measure.[3]

Tests of the differences in proportions of patients in hospitals in each group that received the recommended care were conducted to determine which differences were statistically significant. For four heart attack measures, Minnesota CAHs had an insufficient number of patients to compare results with CAHs nationally. On most of the remaining measures for heart attack, heart failure, and pneumonia patients, the results for Minnesota CAHs were not significantly different from those of CAHs nationally. Minnesota CAHs had significantly lower scores on two measures: smoking cessation advice for heart failure patients and pneumococcal vaccination status for pneumonia patients.

Minnesota rural non-CAHs had insufficient numbers of patients on two heart attack measures to compare their results with rural non-CAHs nationally but had significantly higher scores than rural non-CAHs nationally on eight measures, including three heart attack measures (aspirin at arrival, beta blocker at arrival, and beta blocker at discharge), the heart failure discharge instructions measure, and four pneumonia measures (oxygenation assessment, pneumococcal vaccination status, initial antibiotic within four hours, and smoking cessation advice). On nine measures, their scores were not significantly different from hospitals nationally.

A total of 49 Minnesota CAHs and rural non-CAH hospitals submitted quality measure data to Hospital Compare for both 2004 and 2005 discharges. Table 3 compares rates for these hospitals for both years (data for CAHs and non-CAHs are combined because several hospitals changed status from non-CAH to CAH during this time).

Table 2: *Percent of patients receiving recommended care in Critical Access Hospitals (CAHs) and rural non-CAHs in Minnesota and nationally in 2004.*

		CAHs		Rural Non-CAHs	
Condition	**Measure**	**Minnesota (n = 17)**	**U.S. (n = 468)**	**Minnesota (n = 34)**	**U.S. (n = 1,133)**
Heart Attack	Aspirin at arrival	91.3	89.8	95.1***	91.7
	Aspirin prescribed at discharge	90.8	84.3	91.6	89.3
	ACE inhibitor for LVSD	[1]	74.4	80.9	76.0
	Beta blocker at arrival	82.2	80.5	92.4***	84.3
	Beta blocker prescribed at discharge	76.9	81.4	93.5***	87.2
	Smoking cessation advice	[1]	47.7	77.1	81.2
	Thrombolytic within 30 minutes of hospital arrival	[1]	30.0	[1]	40.0
	PCI within 120 minutes of arrival	[1]	[1]	[1]	62.8
Heart Failure	Assessment of left ventricular function	61.7	64.2	77.7	76.1
	ACE inhibitor for LVSD	73.3	73.4	75.8	72.5
	Discharge instructions	48.4	44.8	63.2***	49.6
	Smoking cessation advice	32.0**	56.9	68.0	68.6
Pneumonia	Oxygenation assessment	98.3	98.3	99.3***	97.4
	Pneumococcal vaccination status	48.8**	55.1	54.6*	52.1
	Initial antibiotic within 4 hours of hospital arrival	84.3	82.3	80.6***	76.2
	Blood culture prior to first antibiotic	85.2	82.4	84.2	83.0
	Smoking cessation advice	61.3	58.4	73.3*	66.6
	Appropriate initial antibiotic selection	73.2	74.5	74.7	73.4

[1]Data on this measure were reported for less than 25 patients total.
***Significant differences in proportions of Minnesota and national patients receiving recommended care at p< .001.
**Significant differences in proportions of Minnesota and national patients receiving recommended care at p< .01.
*Significant differences in proportions of Minnesota and national patients receiving recommended care at p< .05.
Data source: Centers for Medicare and Medicaid Services' Hospital Compare data for January – December 2004 inpatient hospital discharges (downloaded from CMS website September 2005).

Table 3: *Percent of patients receiving recommended care in Minnesota Critical Access Hospitals and non-CAH rural hospitals in 2004 and 2005 (N = 49)*[1]

Condition	Measure	2004	2005
Heart Attack	Aspirin at arrival	94.6	93.0
	Aspirin prescribed at discharge	91.8	91.8
	ACE inhibitor or ARB for LVSD	80.9	85.0
	Beta blocker at arrival	91.1	90.7
	Beta blocker prescribed at discharge	91.7	91.1
	Smoking cessation advice	71.9	83.1
	Thrombolytic within 30 minutes of arrival	35.7	38.2
Heart Failure	Assessment of LVF	75.5	79.0**
	ACE inhibitor or ARB for LVSD	75.2	81.6**
	Discharge instructions	60.6	57.6
	Smoking cessation advice	61.9	70.5
Pneumonia	Oxygenation assessment	99.1	99.5*
	Pneumococcal vaccination status	54.0	72.6***
	Initial antibiotic within 4 hours of arrival	81.1	83.5**
	Blood culture prior to first antibiotic	84.4	85.0
	Smoking cessation advice	70.7	70.5
	Appropriate initial antibiotic selection	74.4	79.3***

[1]Only hospitals that reported data for both 2004 and 2005 discharges are included.
***Significant differences in proportions of patients receiving recommended care in 2004 and 2005 at p< .001.
**Significant differences in proportions of patients receiving recommended care in 2004 and 2005 at p< .01.
*Significant differences in proportions of patients receiving recommended care in 2004 and 2005 at p< .05.
Data source: Centers for Medicare and Medicaid Services' Hospital Compare data for January – December 2004 (as of September 2005) and January – December 2005 inpatient hospital discharges (as of September 2006).

As a group, these hospitals significantly improved their performance on two heart failure measures (assessment of LVF and ACE inhibitor/ARB for LVSD) and four pneumonia measures (oxygenation assessment, pneumococcal vaccination status, initial antibiotic within four hours of arrival, and appropriate initial antibiotic selection.) Changes in some measures are not statistically significant, in part, because they are based on a small number of patients.

Several points are important to consider when evaluating these results. The data presented here are averages for CAHs and rural non-CAHs, but there is variation within these groups, with some hospitals performing better than the average and others performing worse. The CAHs are a self-selected group that voluntarily chose to participate in Hospital Compare, so their results are not necessarily representative of all CAHs in Minnesota or nationally.

Some differences in the proportions of patients receiving recommended care may be due to lack of experience with documentation and reporting on the measures besides actual differences in the care provided. In particular, small rural hospitals that are not JCAHO accredited are likely to have had less experience collecting and reporting data on these quality measures than larger accredited hospitals, which have reported data for patients with these conditions to JCAHO since 2002.

Rural Minnesota hospitals' lowest scores include several measures for which hospitals may need to improve their documentation in medical records, including smoking cessation, pneumococcal vaccination, and heart failure discharge instruction. The past experience of JCAHO accredited hospitals suggests that scores on the smoking cessation measures tend to improve quickly as hospitals become more familiar with the measures and documentation requirements (Williams, Schmaltz, Morton et. al., 2005).

Minnesota rural hospital participation in Leapfrog. The initial three Leapfrog Group "leaps" — implementation of computerized physician order entry systems, staffing of intensive care units with intensivists, and evidence-based referral for certain complex medical procedures — were targeted to urban hospitals. The fourth leap measures hospital performance on 27 National Quality Forum-endorsed safe practices, and Leapfrog has determined that 26 of these practices are applicable to rural hospitals (Figure 2).

As of November 2006, almost one fourth of Minnesota CAHs and half of non-CAH rural hospitals had voluntarily submitted data

Figure 2: *National Quality Forum Safe Practices in Leapfrog Group's Fourth Leap Applicable to Rural Hospitals.*

Create a healthcare culture of safety.
Pharmacists should actively participate in the medication-use process, including, at a minimum, being available for consultation with prescribers on medication ordering, interpretation and review of medication orders, preparation of medications, dispensing of medications, and administration and monitoring of medications.
Verbal orders should be recorded whenever possible and immediately read back to the prescriber—i.e., a healthcare provider receiving a verbal order should read or repeat back the information that the prescriber conveys in order to verify the accuracy of what was heard.
Use only standardized abbreviations and dose designations.
Patient care summaries or other similar records should not be prepared from memory.
Ensure that care information, especially changes in orders and new diagnostic information, is transmitted in a timely and clearly understandable form to all of the patient's current healthcare providers who need that information to provide care.
Ask each patient or legal surrogate to recount what he or she has been told during the informed consent discussion.
Ensure that written documentation of the patient's preference for life-sustaining treatments is prominently displayed in his or her chart.
Implement a standardized protocol to prevent the mislabeling of radiographs.
Implement standardized protocols to prevent the occurrence of wrong-site procedures or wrong-patient procedures.
Evaluate each patient undergoing elective surgery for risk of an acute ischemic cardiac event during surgery, and provide prophylactic treatment of high-risk patients with beta blockers.
Evaluate each patient upon admission, and regularly thereafter, for the risk of developing pressure ulcers. This evaluation should be repeated at regular intervals during care. Clinically appropriate preventive methods should be implemented consequent to the evaluation.
Evaluate each patient upon admission, and regularly thereafter, for the risk of developing deep vein thrombosis (DVT)/venous thromboembolism (VTE). Utilize clinically appropriate methods to prevent DVT/VTE.
Utilize dedicated anti-thrombotic (anti-coagulation) services that facilitate coordinated care management.
Upon admission, and regularly thereafter, evaluate each patient for the risk of aspiration.
Adhere to effective methods of preventing central venous catheter-associated blood stream infections.

Evaluate each pre-operative patient in light of his or her planned surgical procedure for the risk of surgical site infection, and implement appropriate antibiotic prophylaxis and other preventive measures based on that evaluation.
Utilize validated protocols to evaluate patients who are at risk for contrast media-induced renal failure, and utilize a clinically appropriate method for reducing risk of renal injury based on the patient's kidney function evaluation.
Evaluate each patient upon admission, and regularly thereafter, for risk of malnutrition. Employ clinically appropriate strategies to prevent malnutrition.
Whenever a pneumatic tourniquet is used, evaluate the patient for the risk of an ischemic and/or thrombotic complication, and utilize appropriate prophylactic measures.
Decontaminate hands with either a hygienic hand rub or by washing with a disinfectant soap prior to and after direct contact with the patient or objects immediately around the patient.
Vaccinate healthcare workers against influenza to protect both them and patients from influenza.
Keep workspaces where medications are prepared clean, orderly, well lit, and free of clutter, distraction, and noise.
Standardize the methods for labeling, packaging, and storing medications.
Identify all "high alert" drugs (e.g., intravenous adrenergic agonists and antagonists, chemotherapy agents, anticoagulants and anti-thrombotics, concentrated parenteral electrolytes, general anesthetics, neuromuscular blockers, insulin and oral hypoglycemics, narcotics and opiates).
Dispense medications in unit-dose or, when appropriate, unit-of-use form, whenever possible.

Source: Leapfrog Group, 2006.

to the Leapfrog Group on the safe practices leap (Table 4). Of the 29 participating rural hospitals, eight did not yet meet Leapfrog's criteria for a good early stage effort; six were making a good early stage effort; eight were making good progress in implementation; and seven had fully implemented the leap.

As is the case with CAHs and Hospital Compare, the rural hospitals that provided data to Leapfrog voluntarily chose to participate, so their results are not necessarily representative of all rural hospitals in Minnesota. While a number of the participating hospitals are in the early stages of implementing the safe practices leap, seven hospitals, including three CAHs, have fully implemented the leap, suggesting that full implementation is an achievable goal for motivated rural hospitals.

Table 4: *Leapfrog participation and scores for Minnesota Critical Access Hospitals and non-CAH rural hospitals.*

	Critical Access Hospitals (n = 80)	**Rural Non-CAHs** (n = 20)
Participation in Leapfrog Safe Practices Leap	19 (24%)	10 (50%)
Safe Practices Leap Score		
Willing to report publicly; did not yet meet Leapfrog's criteria for a good early stage effort	8	0
Good early stage effort in implementing the leap	5	1
Good progress in implementing the leap	3	5
Fully implemented the leap	3	4

Data source: Leapfrog Group Hospital Quality and Safety Survey Results, 2006.

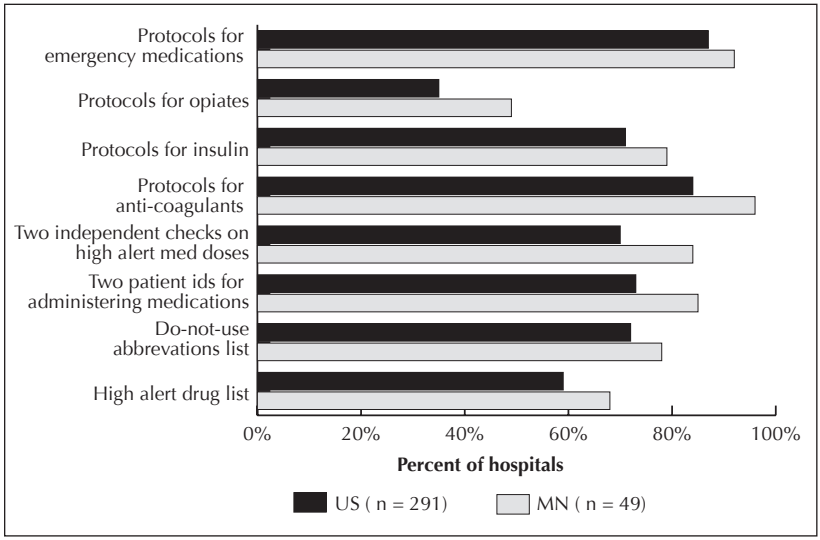
Implementation of Medication Safety Practices in Rural Hospitals. Medication safety is an important quality issue for rural hospitals. JCAHO, NQF, the Institute for Safe Medication Practices (ISMP) and other national- and state-level quality organizations have recommended that hospitals implement key medication safety practices. However, rural hospitals face special challenges in implementing these safety practices because of limited pharmacist staffing, less availability of technology such as computerized pharmacy systems, and limited financial and other resources.

In 2005, the University of Minnesota Rural Health Research Center conducted a national survey of rural hospitals about their implementation of medication safety practices (Casey, Moscovice & Davidson, 2006). The University of Minnesota College of Pharmacy surveyed additional small rural Minnesota hospitals using the same survey questions (Shermoen & Sorensen, 2006). Surveyed hospitals were asked about their implementation of four key medication safety practices:

1) a "do-not-use" abbreviation list (medical abbreviations, symbols and dose designations that have often contributed to serious errors and should never be used);

2) a policy of using two patient identifiers for administering medications;

Figure 3: *Implementation of medication safety practices in rural hospitals with fewer than 50 beds, in Minnesota and nationally, 2005.*



Data Sources: Shermoen and Sorensen, 2006; Unpublished data from the University of Minnesota Rural Health Research Center survey of rural hospitals, 2005.

3) a high alert drug list (drugs that have a high risk of causing serious injury or death if misused); and
4) a policy of having two health professionals independently check doses of high alert medications.

They were also asked if they had implemented protocols for administering four types of high alert medications: emergency medications such as epinephrine drip and nitroglycerin; anti-coagulants; insulin; and opiates. The goal is to have each practice implemented by 100% of hospitals.

Figure 3 compares results for the 49 Minnesota hospitals in the national and Minnesota surveys with the 291 hospitals with 50 beds or less from the national survey. As the chart shows, small rural hospitals in Minnesota were more likely than those nationally to have implemented the four medication safety practices and protocols for the four types of medications. However, like small rural hospitals nationally, Minnesota hospitals still have work to do to achieve full implementation of the practices and protocols.

Improving the Quality of Care in Rural Minnesota Hospitals. The Hospital Compare results provide an opportunity to assess how rural hospitals in Minnesota compare with hospitals nationally on quality measures for conditions commonly cared for in those facilities and how their performance changed from 2004 to 2005. In 2004, the Minnesota CAHs performed as well as CAHs nationally on the majority of quality measures, and the rural non-CAHs performed as well or better than their counterparts nationally on all measures. Since the goal is for all hospitals to improve their performance over time, it is encouraging that the results for Minnesota rural hospitals with two years of data show significant improvement on several measures.

While Minnesota rural hospitals compare favorably overall with rural hospitals nationally on the Hospital Compare measures and medication safety practices, performance still needs to improve to meet the goal of 100% implementation of evidence-based practices. A key component of quality improvement is the use of clinical guidelines and protocols to address processes of care within the hospital and decisions regarding transfer of patients. Cardiac care appears to be an especially important area where many small rural hospitals could improve implementation of clinical guidelines and protocols. According to one recent survey, one third of the 104 predominantly rural Minnesota hospitals without cardiac catheterization labs do not have hospital-specific guidelines, protocols or standing orders for treatment of heart attacks, and only 8% of guidelines address criteria for triage and transfer of patients to a tertiary cardiovascular center (Larson, Sharkey Unger, & Henry, 2005).

Making quality of care standards and measures available to all hospitals

Resources are available to help rural hospitals implement clinical guidelines and protocols, medication safety practices, and health information technology, which can facilitate efforts to measure and improve the quality of health care (Figure 4). The Agency for Healthcare Research and Quality maintains the National Guideline Clearinghouse, a public resource for evidence-based clinical practice guidelines. The Medicare Quality Improvement Community, a national knowledge forum for healthcare and quality improvement professionals, and Stratis Health, Minnesota's QIO, provide links to tools and strategies for improving the quality of care for heart attack, heart failure, pneumonia and surgical patients, as well as other medical conditions on their websites.

Figure 4: *Quality Improvement Resources for Rural Hospitals*

Clinical Guidelines and Protocols
The Agency for Healthcare Research and Quality National Guideline Clearinghouse http://www.guideline.gov/
The Medicare Quality Improvement Community (MedQIC) http://www.medqic.org/
Stratis Health. Tools & Resources Catalog. http://www.stratishealth.org
Medication Safety Tools
American Hospital Association, Health Research and Educational Trust and the Institute for Safe Medication Practices. Pathways for Medication Safety. http://www.medpathways.info/medpathways/tools/tools.html
Institute for Healthcare Improvement (IHI). Medication Systems Tools. http://www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/Tools/
Institute for Safe Medication Practices (ISMP). Medication Safety Tools and Resources. http://www.ismp.org/Tools/default.asp
Joint Commission on Accreditation of Healthcare Organizations (JCAHO). "The Official 'Do Not Use' List." http://www.jointcommission.org/PatientSafety/DoNotUseList/
Grant Programs
Federal Office of Rural Health Policy. Grants to Rural Providers. http://ruralhealth.hrsa.gov/funding/GrantPrograms.htm#providers
Minnesota Department of Health. Office of Rural Health and Primary Care. Grant and Loan Information. Available at: http://www.health.state.mn.us/divs/chs/grants.htm#rural

Resources are available from the American Hospital Association, ISMP, the Institute for Healthcare Improvement, and JCAHO to help hospitals assess and improve their medication use systems, develop organizational strategic plans for medication safety, and implement specific tools such as do-not-use abbreviation and high alert medication lists.

Through the Rural Hospital Flexibility Program (Flex Program), the federal Office of Rural Health Policy provides grants to states to help implement initiatives to strengthen the rural health care infrastructure. Both the Flex Program and Medicare QIOs have a goal of increased CAH participation in Hospital Compare. In Minnesota, CAH participation increased considerably from 2004 to 2005, but 45% of CAHs did not provide data for 2005. Data from these hospitals would help give a more complete picture of the quality of care being provided by rural hospitals in the state.

Improving the quality of care provided by CAHs is an overall goal of the Flex Program, a program especially important for Minnesota since a large percentage of Minnesota's rural hospitals are CAHs. The Office of Rural Health and Primary Care at the Minnesota Department of Health has used Flex grant funds to help support several CAH quality improvement initiatives, including collaborative efforts with Stratis Health, Minnesota's QIO. Flex funds have also helped support participation of CAHs in Comprehensive Advanced Life Support Program training to improve the quality of emergency care provided in rural hospitals.

Small rural hospitals and clinics are less likely than larger urban facilities to have implemented clinical health information technology (HIT) applications such as electronic medical records (Flex Monitoring Team, 2006b; MDH, 2006). CAHs and other small rural hospitals in Minnesota can apply for funding to help implement HIT from the federal Office of Rural Health Policy's grant programs, including the Small Hospital Improvement Program, and from state grant programs administered by ORHPC, including the Rural Hospital Planning and Transition and Rural Hospital Capital Improvement grant programs.

Endnotes

[1] The majority of acute care hospitals are paid under the PPS system for Medicare admissions. The PPS system is based on paying the average cost for treating patients in the same Diagnosis Related Group (DRG). A DRG is assigned to each patient based on their principal diagnosis, complications and comorbidities, surgical procedures, age, gender, and discharge disposition.

[2] According to CMS, many psychiatric, children's, rehabilitation and long-term care hospitals have agreed in principle to provide data using standard quality measures, but do not currently report data because the conditions being measured (care of adults with a heart attack, heart failure, or pneumonia or having surgery) are less commonly treated in these settings.

[3] An alternative method of comparing the performance of hospitals is to calculate mean scores for each hospital individually, and then calculate an average for each group. An advantage of this method is that each hospital contributes equally to the groups' means. However, this "average of averages" method can give a less accurate picture of the performance of a group of hospitals when a large number of the facilities have very small numbers of patients for the measures, as is currently the case with CAHs. For example, if one hospital had 10 out of 20 patients and another hospital had 70 out of 100 patients receiving recommended care for a given measure, the aggregate score across the hospitals would be 67% (80 out of 120 patients). Using the alternative "average of averages" method, the score would be 60%, the average of 50% (10/20) and 70% (70/100).

References

Agency for Healthcare Research and Quality. *National Healthcare Quality Report.* Rockville, MD: AHRQ, December 2005.

Casey, M., Moscovice, I., & Davidson, G. "Pharmacist Staffing, Technology Use and Implementation of Medication Safety Practices in Rural Hospitals." *Journal of Rural Health,* 24 (4), 321-330, 2006.

Centers for Medicare and Medicaid Services. *Hospital Quality Alliance hospital quality measures 2004-2007.* December 2005. Available at: http://www.cms.hhs.gov/HospitalQualityInits/downloads/HospitalHQA2004_2007200512.pdf. (Last accessed December 4, 2006).

Centers for Medicare and Medicaid Services. Hospital Compare Information for Professionals on Data Collection: Description of Measures. Available at: http://www.hospitalcompare.hhs.gov/Hospital/Static/Data-Professionals.asp?dest=NAV|Home|DataDetails|ProfessionalInfo#measureset (Last accessed December 4, 2006).

Flex Monitoring Team. A complete list of CAHs by state. October 5, 2006. Available at: http://www.flexmonitoring.org/cahlistRA.cgi (Last accessed December 4, 2006).

Flex Monitoring Team. The Current Status of Health Information Technology Use in CAHs: Briefing Paper No. 11. May 2006. Available at: http://www.flexmonitoring.org/documents/BriefingPaper11_HIT.pdf (Last accessed December 4, 2006).

Institute of Medicine Committee on Quality of Health Care in America. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: National Academies Press, 2001.

Institute of Medicine, Committee on the Future of Rural Health Care Quality, Board on Health Care Services. *Quality Through Collaboration: The Future of Rural Health Care.* Washington DC: National Academies Press, 2005.

Jenks S, Huff E, and Cuerdon T. Change in the Quality of Care Delivered to Medicare Beneficiaries, 1998-1999 to 2000-2001. *JAMA* 2003; 289(3):305-312.

Larson DM, Sharkey SW, Unger BT, Henry TD. Implementation of acute myocardial infarction guidelines in community hospitals. *Acad Emerg Med*. 2005;12:522-527.

Leapfrog Group. Leapfrog Hospital Quality and Safety Survey Results. Available at: http://www.leapfroggroup.org/cp. (Last accessed December 4, 2006).

Minnesota Department of Health. Minnesota e-Health Progress Report to the Minnesota Legislature. St. Paul, MN: MDH, March 2006. Available at: http://www.health.state.mn.us/e-health/legrpt2006.pdf (Last accessed December 6, 2006).

Moscovice I, Wholey D, Klingner J, Knott A. Measuring rural hospital quality. *Journal of Rural Health*. 2004;20:383-393.

Shermoen K. & Sorensen T. Pharmacy Service Delivery and Patient Safety in Rural Minnesota Hospitals. *Minnesota Pharmacist* March/April 2006, 24-29.

Williams, S., Schmaltz, S., Morton, D., Koss, R., & Loeb, J. (2005). Quality of care in U.S. hospitals as reflected by standardized measures, 2002-2004. *New England Journal of Medicine, 353*(3), 255-264.

Small Fish in a Big Pond: EMS Issues in Greater Minnesota

Gary Wingrove & Aarron Reinert

Why should rural communities be concerned about their local ambulance service? Because if they aren't, they might find themselves without one located in their community, as has happened in the Minnesota communities of Belview (2002), Wykoff (2003), Osakis (2004) and Kenyon (2006).

Since 9/11 there has been immense federal, state, regional and local support provided to public safety agencies to combat potential terrorism. Public health and health care providers have also received extra public funding aimed at the potential threats of bird flu and bioterrorism. But as the only professional group currently operating in all three sectors, ambulance services remain a step-child of each.

"We're first responders!" say police and fire agencies. "We're first receivers!" tout hospitals. "Our surveillance and prevention can stop the spread and save the masses!" cries the public health system. Yet there is another piece to this puzzle. When not enough of the public has been surveilled to ring the alarm yet, but they've been triaged by the first responders, somebody must take them to the first receivers.

Most of Minnesota's ambulance services are located in rural areas (231 vs. 41 in urban areas), even though the majority of ambulance volume is in metropolitan areas. Only 25 of 272 ambulance services operated in areas with more than 40,000 residents in 2002, with another 26 in areas of 20,000 to 40,000. The typical rural ambulance service has 26 personnel, two ambulances, and transports 480 patients per year to hospitals two to 70 miles away. On a per-capita basis, both urban and rural Minnesota ambulance services transport about five people per 100 residents[1].

For every paid ambulance worker in Minnesota, there are 1.4 volunteers. Of 4,533 rural ambulance personnel in Minnesota in 2002, 3,481 were volunteers. To be a volunteer, each person must complete 110 hours or more of initial medical training, plus 24 hours or more of training every two years. The average ambulance attendant is

20 to 40 years old and has been in the business six years or more. Daytime hours, weekends and holidays are the most problematic shifts to fill, and about 900 ambulance personnel, half from rural areas, leave an ambulance service each year. At any given time, 74% of Minnesota's ambulance services are trying to add staff.[2]

Recent EMS Topics

The ambulance industry has been through considerable change over the last decade, and the industry's issues are magnified in rural areas, where demands are high but resources scarce.

The National Rural Health Association (NRHA) recently described rural EMS as "under-developed," "under-technologized," and "under supported." In its 2005 briefing,[3] NRHA listed (in no particular order) recruitment and retention, inadequate reimbursement, training, transport distances and medical direction as the five major issues facing the industry. At a summit in October 2006, nearly 50 EMS leaders in Minnesota identified the top five issues for the industry, in order, as regional program support, workforce and staffing, funding, quality improvement and leadership.

Each of these two independent events identified an identical set of EMS issues, as noted in the chart below.

EMS Issue	MN EMS Summit	NRHA Workforce Paper
Care Barriers	Regional Program Support	Transport Distances
Workforce	Workforce & Staffing	Recruitment & Retention
Finances	Funding	Inadequate Reimbursement
Performance Improvement	Quality Improvement	Medical Direction
Management	Leadership	Training

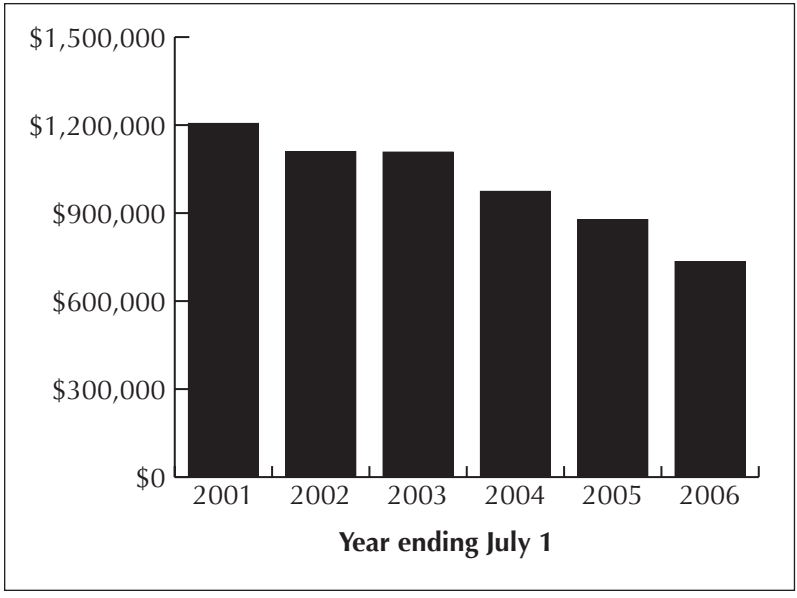
Care Barriers. Minnesota's EMS system is unique. The state essentially grants an exclusive franchise to a provider for a given territory. In exchange, the ambulance service must answer all requests for service, regardless of ability to pay, 24 hours a day. The system consists of local providers, eight regional EMS programs and a state board financed by the state's general fund. Eight regional EMS programs are financed primarily through a combination of state aid and seat belt violation fines. Local providers are funded primarily through user fees, which in some cases are supplemented by local taxes.

Minnesota's eight regional EMS programs operate either as non-profit companies or joint powers boards. Their state aid grant funding is tied to overall state objectives. Their share of seat belt fines, however, is controlled by the board of directors for the regional entity. This mix of funding addresses issues of statewide significance while at the same time meeting local needs.

In recent years the funds used by regional EMS programs to address local needs — seat belt fines — have been decreasing. The reasons for this are unclear: there has not been a substantial rise in seat belt usage. Some believe law enforcement officers are writing fewer tickets, that fines are not being prosecuted, or that the seat belt fine is plea-bargained away at the judicial level. Also, while the seat belt fine itself is modest ($25), surcharges that can be added to the fine to fund such things as judicial libraries and local courts can push the final cost to an unacceptable level, in many cases exceeding $75, potentially creating a situation where officers are reluctant to write the ticket, prosecutors are reluctant to prosecute it, and it is easier for the courts to dismiss the seatbelt violation than the actual reason the person was stopped in the first place (seat belt violations are a secondary offense in Minnesota).

Workforce. The government tells us volunteerism is on the rise in America, which may be true in some sectors of society, but not in

Figure 1: *Seat belt funds distributed to Minnesota regional EMS programs.*



EMS. Staffing an ambulance is harder to do than staffing a fire truck. The reason is simple: the ambulance crew is much busier. When a community calls on its volunteer fire crew once every other month, the burden of volunteering is minimal. When a volunteer must commit to 12-hour shifts three or more days a week and is called into service one or more times each shift, the burden of volunteering is significantly increased.

Thus, recruitment and retention of volunteer ambulance personnel becomes a fine art. Rural volunteer ambulance services across Minnesota have been experiencing a crisis in recruiting and maintaining staff to provide pre-hospital emergency medical services. The Office of Rural Health and Primary Care[4] highlighted this crisis in a 2002 study of volunteer ambulance services. The study identified several areas for consideration, including "perceptions about the nature of the work, time and training demands, compensation, and changing demographics." The study also reported that of all rural ambulance personnel, nearly half (45%), are age 40 or older.

The combination of these factors jeopardizes the very existence of rural ambulance services and their ability to respond to the critically ill and injured. The Emergency Medical Services Regulatory Board (EMSRB) is the state agency charged with regulating access and care provided by pre-hospital care providers. Ensuring the recruitment and retention of staff is critical to the shared mission of the state and regional boards in protecting the public.

The EMSRB estimates there are more than 400,000 requests every year in the state for an ambulance. Unfortunately, some who call 911 face extra wait time for the next closest ambulance to come because their local ambulance service has closed. This can result in an extra 30- or 40-minute wait before the ambulance from the next town can arrive to provide care. This example is becoming more of a reality than fiction as the workforce of rural ambulance services ages and ways to motivate the current generation to volunteer are not completely understood.

Little research has been conducted on recruitment and retention issues for rural volunteer ambulance services. Many journals document the crisis of recruiting and retaining personnel, but few suggest solutions. Literature from other healthcare industries, specifically nursing, might provide concepts that could easily be adapted and applied to rural ambulance services.

Current and future leaders of ambulance services should be interested in this topic as they strive to understand what motivates people today and what may motivate people in the future to become

part of their organizations and to understand techniques that will maintain the workforce. Without this knowledge, recruitment of personnel will be extremely difficult, and those who are recruited might not be the type of personnel they desire. The problem is compounded when they have recruited the right personnel and invested countless dollars in training them only to lose them. With these losses the vicious circle begins again.

Finances. The average ambulance service in Minnesota has seen a 58% reduction in Medicare payments since 2002.[5] In the Balanced Budget Act of 1997, Congress mandated that Medicare put ambulance services on a fee schedule. Prior to 2002 when the fee schedule was adopted, Minnesota's ambulance services received higher payments than those in other states. When the fee schedule was fully implemented Jan. 1, 2006, it nationalized the payments, hitting Minnesota providers particularly hard.

Many ambulance services have made adjustments in their operations and pricing to accommodate these lower payments, but there is still work to be done. There are best practices that can be put into place to help mitigate loss of fees, some examples of which can be found in the *Recommendations* section.

Performance Improvement. Quality and performance are the current buzz words in healthcare. "Pay for Performance," still in the experimental stage, may become the payment methodology for health care in the future.

Much of the federal activity in the health arena surrounds performance and quality improvements, benchmarking and indicator development. Some activity also exists within EMS in these arenas through development of the National EMS Information System (NEMSIS), the Open Source EMS Initiative's Performance Indicator Development Project, and the National EMS Performance Measures Project. However, EMS is behind the curve in relationship to other sectors of the healthcare community.

EMS can lead other sectors of the healthcare community in implementation of data systems because EMS already has both a national common data dictionary that has standardized the data elements and a uniform transaction standard for passing data from the provider to the state and to the federal government. Now, instead of data vendors keeping data systems proprietary, they are all forced to compete on cost and quality. Minnesota is a leader in the national system, too, and should be proud that it is one of the first five states to begin reporting data into the national EMS data bank, thanks to

the efforts of the EMSRB and all the ambulance services.

After watching performance measures fail rural hospitals miserably, the North Central EMS Institute, based in St. Cloud, led a national consensus process in June 2005 to develop measures applicable to every ambulance service in the country. While outcome measure reporting is not yet mandated for ambulance services, many believe it soon may be and that payments will be based upon it, and now, thanks to Minnesota efforts, workable measures identified.

Having access to a physician for medical direction is still an issue for some rural ambulance services. Here also innovative models of regionalized medical direction in our state have become national models. For nearly 20 years ambulance services in southeast Minnesota have been able to receive medical direction through a consortium operated by their regional EMS program. This has provided services with high quality medical directors who are interested in EMS and are willing to help them make a difference. A similar model is available in the south central region.

Minnesota's EMS data collection system, operated by the EMSRB, is also able to produce some quality reporting back to ambulance services. Many services have used the system to work with local elected officials and others to secure funding.

Management. While some rural ambulance services still operate with governing boards consisting solely of the ambulance staff, that model is no longer feasible. All of the issues previously raised require that today's ambulance services be managed by accountable boards.

While recruitment and retention issues in EMS are concerns, businesses cannot be operated by untrained management and remain sustainable. In the case of ambulance services that are "owned" by city councils or counties, elected officials have fiduciary responsibility to the corporation in addition to their responsibilities to assure service to the citizens. It is not enough for the local ambulance service simply to report once or twice a year to the city council; the council itself must assure the viability of the entity throughout the year.

Recommendations

There are several steps individuals and communities can take to help their local EMS system address these major issues.

• ***The Minnesota legislature should not allow additional surcharges to be added to the seat belt fine.*** Since the seat belt ticket revenue provided to Minnesota's regional EMS programs

is decreasing and it is not a result of increased seat belt usage, the parties that receive the surcharges that are added to the fine may not need them. If they did need this revenue, tickets would be written, prosecuted and upheld. The results of the tickets not being written, prosecuted and upheld are two-fold: the public is left with the message that seat belts aren't important, and the funding that is critical for local EMS needs vanishes.

• ***Dedicate strategic resources to recruitment and retention.*** Many organizations have made significant improvements in recruitment and retention by dedicating strategic resources toward the issue. The legislature should provide funds to the EMSRB to add one staff member dedicated to developing and implementing recruitment activities for rural ambulance services. These activities could include developing a pilot rural ambulance recruitment program that includes templates, promotional materials, and training. A statewide recruitment program would allow rural ambulance services to benefit from the work that has already been completed while still tailoring the program to individual needs.

A statewide recruitment website should be developed and used to link potential volunteers with ambulance services in their area. The site could provide information to interested individuals about EMS as well as expectations and requirements for being an EMT on a rural ambulance service. With a relatively small appropriation, significant improvements in rural ambulance recruitment are possible.

• ***Target the right people.*** Many rural ambulance services already conduct recruitment activities, but their recruitment programs may not be targeting pools of people with the most potential or considering the motivators and barriers for volunteerism of the current generation. Ambulance services should integrate recruitment into their annual planning, with involvement of their governing board. This strategic focus will enable each service to consider recruitment activities at the same level of importance as other strategic items, such as new facilities or vehicles. A cross-functional team should be established to develop and implement recruitment activities. This team could be made up of individuals from the local ambulance service, such as new and experienced EMTs, but also include community members such as church and business leaders and local elected officials. The mix would allow for creative ideas as well as build support throughout the community for the needs of the local ambulance service.

• ***Grassroots recruiting.*** Ambulance services should have grassroots recruitment programs that encourage staff members to recruit new personnel themselves. A one-on-one connection like this could allow for mentoring of the new individual.

• ***Accountable boards.*** Ambulance services should have fully functional and accountable boards made up of a variety of talents from within the community. CPAs, elected officials, bankers, leaders of non-profit organizations and others should be represented. Crew members and clients (hospitals, nursing homes, and the general public) should serve as an advisory committee for the board. These boards should complete a strategic planning process that includes examining ways to partner with adjoining services to reduce costs, specifically in the areas of management/oversight and training. While two services in neighboring communities may not be able to support full-time managers individually, they may be able to afford one jointly. Communities that are close to one another should consider combining their ambulance services into one functional unit to achieve other efficiencies.

• ***Use professional billing services.*** Today's ambulance biller must stay abreast of complex and changing regulations to avoid inaccurate or incorrect billing. At the same time, professional ambulance billing companies have proven more successful at collecting delinquent accounts. Some municipal ambulance services have reported collections increasing by up to 50% by using professional billings services. As no credentialing body for ambulance billing companies exists, the best choice is to select one that is a member of the Minnesota Ambulance Association and the American Ambulance Association. Members of these associations receive regular updates on billing changes.

• ***Seek non-traditional volunteers.*** Ambulance services worry about recruiting volunteer personnel, but they might also overlook the obvious. It may be possible to recruit a volunteer accountant into the organization or a grant writer for help with grant applications. It might be possible to recruit a stay-at-home parent who could be immediately available to care for children so that another parent could serve as an EMT.

• ***Use buying groups.*** Members of the Minnesota Ambulance Association have access to national pricing through the North Central EMS Cooperative (NCEMSC). Since NCEMSC has nearly

1,000 members in 24 states, all buying products under the same contracts, substantial savings can be achieved by participating in this program. Minnesota law carves out a special exemption from the state's bidding law for municipal ambulance services to allow them to participate in NCEMSC's programs.

• ***Apply for grants.*** Many Minnesota ambulance services are eligible for federal grant programs but do not apply because they don't know they are eligible. For example, there is a section of the Assistance to Firefighters grant program that makes non-profit, non-hospital, non-fire ambulance services eligible for portions of that program's funds. Ambulance services that are fire-based are eligible for all of that program's funds.

• ***Businesses can contribute.*** Little things can make a difference. Ambulance personnel have a considerable amount of required ongoing training. Local pizza parlors could donate pizzas and pop for training night. The local auto dealer could contribute routine vehicle maintenance and assure the ambulance service is accessing available discount programs when purchasing replacement ambulances.

• ***Support and use MnStar.*** The EMSRB's data collection system holds a wealth of data, information that can be used to report quality measures, make staffing decisions, justify rates, apply for grants and seek financial subsidies. If all goes well at the federal level, MnStar can also provide the data needed to report quality measures under Pay for Performance.

Ambulance services are critical to rural communities where other health care providers are scarce and far between. But rural ambulance services also have a number of inherent issues to address. Some of the keys to maintaining vibrant rural ambulance services are an adequate state support system, excellent board members, adequately trained management, and experienced crew members. But above all, the key to success is a caring community.

Endnotes

[1] Minnesota Department of Health (2002, December). *A Quiet Crisis: Minnesota's Rural Ambulance Services at Risk*. Retrieved December 7, 2006 from Minnesota Department of Health: http://www.health.state.mn.us/divs/chs/rhpc/PDFdocs/ambulancerpt.pdf.
[2] Ibid.
[3] National Rural Health Association (2005, November). *Recruitment and Retention of a Quality Workforce in Rural Areas: Number 13 – Emergency Medical Services*. Retrieved November 29, 2006 from National Rural Health Association: http://www.nrharural.org/advocacy/sub/issuepapers/Workforce12EMS.pdf.
[4] Minnesota Department of Health (2002, December). *A Quiet Crisis: Minnesota's Rural Ambulance Services at Risk*. Retrieved December 7, 2006 from Minnesota Department of Health: http://www.health.state.mn.us/divs/chs/rhpc/PDFdocs/ambulancerpt.pdf.
[5] Personal communication: Minnesota Ambulance Association Billing and Financial Data Committee.

About the Authors

LIZ QUAM serves as director of the CDI Institute, an initiative of the Center for Diagnostic Imaging, dedicated to professional development for radiologists and identification of quality indicators for purchasers of health care. Liz also serves as volunteer executive vice president of Advocates for Marketplace Options for Mainstreet (AMOM), a non-profit coalition that fosters more options for health care providers and employers. She has served on a number of non-profit boards, including her current service as president-elect of the Minnesota Rural Health Association. She is also a member of the University of Minnesota, Crookston, Advisory Task Force. She is a frequent presenter and author regarding health care industry issues.

SARAH SPRENGELER grew up in St. Cloud, Minn., where she attended Cathedral High School. From there, she spent a year at Gustavus Adolphus College in St. Peter before transferring to Concordia University in St. Paul, where she majored in biochemistry and completed pre-medical coursework. In the fall of 2003, she matriculated at the University of Minnesota School of Medicine in Duluth. This summer, Sarah will begin a three-year residency in Family Medicine, location TBA.

At home in Duluth, Sarah enjoys spending time with her husband, Mike, nine-month-old daughter, Julia, and their dog and cat. She loves to cook, entertain, and grow roses. Mike is in school to be a pharmacist, and the couple plans to move to a small community in Minnesota and practice medicine. Sarah also hopes to raise

alpacas someday. She and Mike love to travel and can't wait for the day they get to return to Europe.

KATHLEEN THIEDE CALL is an Associate Professor at the University of Minnesota School of Public Health, Division of Health Management and Policy, and Investigator at the State Health Access Data Assistance Center (SHADAC) funded by the Robert Wood Johnson Foundation, which assists other states in monitoring rates of coverage and using data to inform policy and improve access. Her research falls into two related areas. The first is access to health insurance coverage and health care services among low-income, young, elderly, chronically ill and rural populations and racial and ethnic communities. Within that domain, she has helped create a survey of health insurance coverage for use by states and has developed a stream of research concerning the complexities of measuring health insurance coverage. The second area of research Dr. Call is developing is community-based participatory research focusing on barriers to health care.

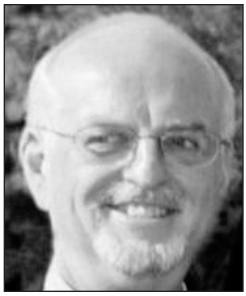
JEANETTE ZIEGENFUSS is a doctoral candidate in the Division of Health Policy and Management at the University of Minnesota School of Public Health. She is a research assistant at the State Health Access Data Assistance Center (SHADAC), also at the University of Minnesota. Jeanette's primary research experience includes measurement of the uninsured and policy solutions to increase participation in public health insurance programs. Jeanette was a collaborating author of "Health Insurance Coverage in Minnesota: Trends from 2001 to 2004."

JULIE SONIER is director of the Health Economics Program at the Minnesota Department of Health. The Health Economics Program conducts research and applied policy analysis to monitor changes in Minnesota's health care marketplace, to understand factors influencing health care cost, quality and access, and to provide technical assistance in the development of state health care policy. Ms. Sonier manages the work of research staff analyzing trends in health care costs, quality, and access in Minnesota and their implications for public policy. Prior to joining the Minnesota

Department of Health in 1997, Ms. Sonier was a policy analyst in Washington, D.C., for the Executive Office of the President, Office of Management and Budget. Ms. Sonier holds a master's degree in public affairs from Princeton University's Woodrow Wilson School of Public and International Affairs and an undergraduate degree in economics from Amherst College.

J. H. "JAY" FONKERT is the senior health workforce analyst at the Office of Rural Health and Primary Care in the Minnesota Department of Health, where he coordinates the Minnesota health workforce survey program. His special interests include work force geography and the role of health care in rural development. Prior to joining the Minnesota Department of Health, he was a policy analyst and planner at Minnesota Planning. He worked on a wide variety of topics, including state-local relations, airline competition, rural economic development and K-12 education. He was a contributing author of the state government budget study *Within Our Means* and a lead author for *Minnesota Milestones*. Jay has a master's degree in political science from the University of Illinois and in public affairs from the University of Minnesota. He has also done advanced graduate study in geography at the University of Minnesota.

KAREN WELLE is assistant director of the Minnesota Department of Health's Office of Rural Health and Primary Care and has served in that capacity since 1998. Within her broad role in helping lead programs and operations that support access to rural and primary health care, Karen has focused primarily on health workforce issues and strategic initiatives. In that context, she has led the Office's recent efforts to support development of telehealth services in response to current and predicted health workforce shortages in Minnesota's rural communities. Karen holds a master's degree in public administration from Hamline University and obtained her undergraduate degree in occupational therapy from the College of St. Catherine. She was born and raised in Melrose, Minn.



STUART M. SPEEDIE, PH.D., a professor of health informatics and director of education informatics at the University of Minnesota Medical School, has directed a telemedicine network for the last 10 years. He holds a bachelor of science degree in computer science and a Ph.D. in educational research from Purdue University. As an expansion of telemedicine, Dr. Speedie is now working to extend the reach of telemedicine into the home in research projects involving home videoconferencing, the Internet and home monitoring. His research interests focus on the outcomes of employing these technologies — patient well-being, financial costs and benefits, and impact on the providers of care.

ANDREW TRAYNOR, PHARM.D., BCPS, is Assistant Professor of Pharmacy, Assistant Residency Director of the Pharmaceutical Care Residency Program, and a member of the Pharmacy Rural Education, Practice, and Policy Institute at the College of Pharmacy, University of Minnesota, Duluth campus. His current research interests focus on risk for loss of pharmacy services and student perceptions of pharmacy practice in rural areas, pharmaceutical care practice development and education related to pharmacy practice skill development.

Andrew received his Doctor of Pharmacy in 2004 from the University of Minnesota and completed a Pharmaceutical Care Leadership Residency at the University of Minnesota in 2006. He has served as National President of the American Pharmacists Association — Academy of Students of Pharmacy and as a Trustee of the American Pharmacists Association.

TODD D. SORENSEN, PHARM.D., is associate professor and director of the Pharmaceutical Care Residency Program and a member of the Pharmacy Rural Education, Practice, and Policy Institute at the University of Minnesota College of Pharmacy. His research focuses on increasing access to pharmaceutical care and affordable medications in underserved communities. He has worked with rural communities to address

pharmacist workforce issues, evaluate risk for loss of local pharmacy services and implement innovative pharmacy practice models in Critical Access Hospitals. Todd's work has also focused on federally qualified community health centers, increasing access of affordable medications to uninsured patients while integrating pharmacists into the delivery of primary care.

Todd received his Bachelor of Science in Pharmacy in 1993 and Doctor of Pharmacy in 1994, both from the University of Minnesota. He currently serves as the President of the Minnesota Pharmacists Association.

TOM LARSON, PHARM.D., FCCP, is Associate Dean of Clinical Affairs, Director of the Pharmacy Rural Education, Practice, and Policy Institute and Professor of Pharmacy at the University of Minnesota College of Pharmacy. His current scholarship centers on rural health care systems as they relate to rural access to pharmaceutical care. Much of Dr. Larson's work has focused on pharmaceutical care practice development as a means of recruitment and retention of pharmacists in rural health systems.

Tom received his Bachelor of Science in Pharmacy in 1979 and Doctor of Pharmacy in 1980, both from the University of Minnesota. He also completed an Infectious Disease Fellowship at the Veterans Administration Medical Center in 1981. He has served as president of the Minnesota Rural Health Association and was awarded their Outstanding Service Award in 2004.

LARHAE GRINDAL KNATTERUD has a BA from Augsburg College in Minneapolis and an MAPA from the Humphrey Institute of Public Affairs, University of Minnesota, with major concentrations in gerontology and health care policy. She began her career at the Area Agency on Aging for the Twin Cities, which was at that time housed at the Metropolitan Council.

She is currently Director of Aging Transformation for the Continuing Care Administration at the Minnesota Department of Human Services and has worked there for the past 12 years. Her responsibilities have included leader of Project 2030, an effort to identify the impacts of the aging of Minnesota's population over the next 30 years; chief

staff to the state's long-term care task force, from 2000 to 2003; and coordinator of Minnesota's efforts on long-term care financing reform. Currently, she is staff leader for the department's Transform 2010, a project to prepare Minnesota for the aging of the state's population, especially as the large baby boom generation begins to turn 65 in 2011.

MICHELLE CASEY is a Senior Research Fellow and Deputy Director of the University of Minnesota Rural Health Research Center, where she has worked since 1994. Her research interests include access to care for rural Medicare beneficiaries and underserved populations; rural quality and patient safety initiatives; hospice and end-of-life care in rural communities; the use of preventive health services by rural populations; access to pharmacy services in rural areas; and the Medicare Rural Hospital Flexibility Monitoring Program. She has published extensively on rural health issues in peer-reviewed journals, and received the National Rural Health Association Outstanding Rural Health Researcher Award in May 2006.

Michelle previously worked on health policy analysis and rural health programs at the Minnesota Department of Health. She played a key role in establishing the Minnesota Office of Rural Health and Primary Care and served as Assistant Director of the Office from 1992 to 1994. She has a bachelor's degree from Grinnell College in Iowa and a master's degree from the University of Wisconsin, Madison.

GARY WINGROVE is manager of Government Relations and Strategic Affairs for Gold Cross/ Mayo Medical Transportation. He is a former state EMS director and serves on the national advisory committees for the Rural EMS & Trauma Technical Assistance Center and the Technical Assistance and Services Center for the national Critical Access Hospital program. Gary chairs the National Rural Health Association's EMS Issue Group and received the 2005 American Ambulance Association President's Award for his national focus on rural EMS. He grew up in rural Iowa and lives in rural Minnesota with his wife Karen and 8-year-old twins, Joey & Allie.

AARRON REINERT is the executive director for Lakes Region EMS, a rural and metropolitan ambulance service composed of 40 full-time staff with a Paramedic/EMT staffing pattern covering a 450-square-mile service area. Prior to Lakes Region EMS, Aarron was the field services manager for the Minnesota Emergency Medical Services Regulatory Board. At the EMSRB, his projects included creating and implementing a statewide web-based data collection system, developing statewide EMS communication systems, and coordinating EMS bioterrorism preparedness. He is a practicing paramedic, a regular educator for ambulance management, and a consultant for Public Safety Communications and EMS data collection.

About the Center for Rural Policy and Development

In 1997, a group of rural Minnesota advocates came together around a bold idea: to create a rural policy think tank that would provide policy makers, rural advocates and concerned citizens with an objective, unbiased and politically "unspun" examination of contemporary rural issues.

Funded through a public-private partnership, the Center for Rural Policy and Development today is an independent non-profit research organization dedicated to the objective study of the economic, social and cultural forces that are impacting rural Minnesotans and the communities they reside in. Over the years, our audience has grown to include state legislators, city and county officials, community leaders, business executives, college presidents, school superintendents and everyday citizens concerned about rural Minnesota and its future.

Hopefully, you will agree that RMJ is one of those resources worth having. To that end, we invite you to visit our web site at www.ruralmn.org to learn more about the Center for Rural Policy and Development, our resources and programs, and ways you can support RMJ.

To add your voice and join the Center for Rural Policy and Development, please see the membership form on the following page.

CENTER *for* RURAL POLICY
and DEVELOPMENT

Seeking solutions for Greater Minnesota's future

Yes, I would like support the Center.

We invite you to add your voice by becoming a contibuting member of the Center for Rural Policy and Development. Contributors automatically receive copies of all our publications, our quarterly newsletter and discounted registrations to Center events.

Name: _____

Organization: _____

Address: _____

_____

City/State/Zip: _____

Phone: _____

E-mail: _____

Individual	Organization	Benefactor
❍ $50 & above	❍ $100 & above	❍ $1,000 & above
$	$	$

Join by mail:

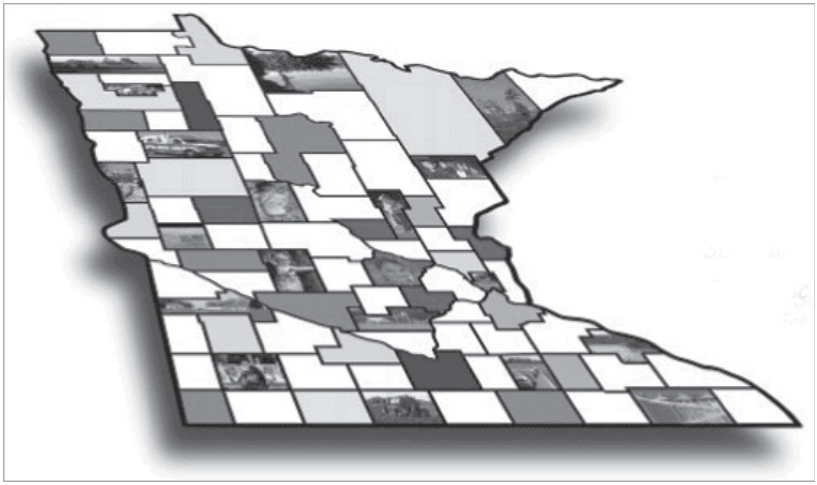
Center for Rural Policy & Development
600 S. Fifth St., Suite 211
Saint Peter, MN 56082
(507) 934-7700 • (877) RURALMN
(507) 934-7704 (fax)

Or online:

Use your credit card to make a contribution online. Visit our web site at **www.ruralmn.org** and look for the Add Your Voice link on our home page.

Please select a contribution level:
The Center for Rural Policy & Development is a 501(c)3 non-profit organization. Your contribution is tax-deductible.

❍ Occasionally the Center will publish lists of contributors in publications and on our web site. Please check here if you *do not* wish to be included in lists.



Atlas of Minnesota Online

Announcing the expanded *Atlas of Minnesota Online*, the newest information tool from the Center for Rural Policy and Development.

The *Atlas of Minnesota Online* is the next step in the Center's series of successful Minnesota Atlases, featuring social, demographic and economic data in map form at the county and school district level.

Each map is updated regularly with the most current data available from federal and state sources. The *Atlas* is extremely user-friendly. *No special skills or software is required.* To view the maps, visit **www.ruralmn.org** and click on the *Atlas Online* button. Select your map from the chapter menu on the left side of the page. Rolling over individual counties will reveal the precise data for that particular county or school district.

Individual maps and entire chapters can also be downloaded as PDF files and Powerpoint slides. The *Atlas* should be a valuable tool for policy makers, planners, grant writers and anyone else interested in information on Minnesota.

Visit the *Atlas of Minnesota Online* at www.ruralmn.org.

Welcome to Rural Minnesota Radio!

Welcome to RuralMn Radio, a production of the Center for Rural Policy and Development. RuralMn Radio, featuring Center president Jack Geller and outreach coordinator Larry Anderson, brings the discussion and information on rural issues to Minnesota residents.

RuralMn Radio can be heard across the state on KTOE 1420 AM (Mankato), KBEW in Blue Earth, KRBI (St. Peter), KYSM and KXLP (Mankato), KWOA (Worthington), KWNO and KAGE (Winona), KLTF (Little Falls), and KMRS (Morris). RuralMn Radio is available to any Minnesota radio station free of charge. If you are a radio station that would like to run RuralMn Radio, please let us know and we'll put you on our subscription list.

You can download each program at our web site and listen to it as an mp3 file — each is about 3 minutes long. And contact the Center if you would like more information on RuralMn Radio or to suggest a topic for discussion on future programs. Thanks for listening!

www.ruralmn.org

Center for Rural Policy & Development
600 S. Fifth St., Suite 211
Saint Peter, MN 56082

(507) 934-7700
(877) RURALMN

www.ruralmn.org