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Rural Minnesota Health Care

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This brief overview article will document general information that indicates the status of rural health care in Minnesota. It will conclude with a brief look at a few short-term (three to five years) challenges. The short-term comments reflect the need to embrace and mature the current efforts on quality, workforce, delivery of services, application of technology, and financing, and do not entertain major changes in delivery and financing systems.

The state of Minnesota has a population of approximately 4.9 million, with 41 percent of the population in rural areas, and 59 percent in the seven-county metropolitan area, Duluth, Rochester, and St. Cloud (Table 1). Rural Minnesota is projected to grow by 30 percent in 2030 while urban Minnesota is projected to grow by 29 percent.

Rural Minnesota is partially bordered and internally graced by great and small lakes, rivers, and streams. Residents and visitors of the state enjoy geography varying from plains, rolling hills and valleys, to the rugged forests of the northeastern coastline. As noted above, slightly less than one-half of the state population resides in the rural areas of the state. Population densities vary from frontier to urban, reflecting the geography and commerce of the state. State geography, weather, commerce, and demographics are all factors as the health care and education systems are continually molded to best serve rural populations.

Rural ethnicity is becoming more diverse and reflects the changing demographics of the State of Minnesota. The 2000 U.S. Census revealed that the population of Minnesota is predominantly white, 89.4 percent. Black or African-Americans, American Indians, Alaska natives, and Asians make up 7.5 percent of Minnesota's population (Table 2). Rural Minnesota is experiencing a large influx of Latinos. New Americans are becoming more diverse in their placement in the state and taking on employment in rural Minnesota.

Table 1: *Interim Projections: Ranking of Census 2000 and Projected 2030 State Population and Change: 2000 to 2030*

Minnesota Counties	2000 Census	2005	2010	2015	2020	2025	2030	Percent Change
Rural Counties*	1,981,673	2,143,420	2,235,588	2,328,369	2,417,134	2,503,779	2,578,229	30%
Urban Counties**	2,868,570	3,053,850	3,216,970	3,362,624	3,488,708	3,596,336	3,690,847	29%
Total	4,850,243	5,197,180	5,452,558	5,693,893	5,909,842	6,100,115	6,269,076	29%

Source: U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.
Internet Release Date: April 21, 2005.
** Adjusted*
*** Not Adjusted*

Table 2: *Profile of Race Demographic Characteristics for Minnesota: 2000*

Race	Population	Percent
White	4,400,282	89.4%
Black or African American	171,731	3.5%
American Indian & Alaska Native	54,967	1.1%
Asian	141,968	2.9%
Native Hawaiian & Other Pacific Islander	1,979	
Some other race	65,810	1.3%
Two or more races	82,742	1.7%
Total Population	4,919,479	100%

Source: U.S. Census Bureau, Census 2000.

The Minnesota Department of Administration reports that 12 percent of Minnesota residents were age 65 and older in 2002 (15% of rural Minnesota residents and 10% of urban Minnesota residents) (*Minnesota Department of Administration Information Center, http://server.admin.state.mn.us/resource.html?Id=31242004).* By 2020, both rural and urban Minnesotans are projected to age, with the largest increases in population occurring in the 65-84 age groups. The number of Minnesota residents age 65 and older will increase to 14 percent in urban and 19 percent in rural Minnesota, indicating an increased need for long-term care services *(Reshaping Long-Term Care in Minnesota*, State of Minnesota Long-Term Care Task Force, January 2001).

Population drains continue from west, west central, northwest, and southwest Minnesota, with a decreasing tax base to support an economically deprived and aging population in those areas. The health insurance coverage in rural Minnesota impacts the funding for health care services. In 2004, the Minnesota Health Economics Program at the Minnesota Department of Health found that 6.7 percent of Minnesotans were uninsured, compared to 5.4 percent in 2001. Both the Twin Cities and Greater Minnesota had statistically significant increases from 2001 to 2004, and the rate in Greater Minnesota was 6.8 percent (*Minnesota Department of Health, Health Economics Program, Fact Sheet 2005, Health Insurance Coverage in Minnesota, 2001 vs. 2004).* According to the most recent data available, the counties with the highest rates of uninsured in 2001 were Mahnomen (13.5%), Clearwater (12.2%), Cass (12.5%), Becker (11.3%), and Crow Wing (10.9%) (*Minnesota Department of Health, Health Economics Program, Issue Brief 2002-2005, 2001 Health Insurance*

Coverage for Minnesota Counties, December 2002).

The supply and distribution of health care providers in rural Minnesota significantly impacts access to care. A number of studies have been conducted and corresponding initiatives have been implemented to address rural workforce shortages. The greatest number of active, licensed physicians that responded to the 2004 Minnesota Department of Health, Office of Rural Health and Primary Care Physician Licensure survey were in Family Medicine (Table 3), both in rural and urban Minnesota. Of the 2,169 licensed Family Medicine physicians that responded in 2004, 57.5 percent were practicing in urban Minnesota and 42.5 percent were practicing in rural Minnesota. A higher proportion of the 1,375 Internal Medicine physicians were practicing in urban Minnesota while 17.4 percent were practicing in rural Minnesota; however Internal Medicine was the second most frequent specialty in rural Minnesota.

Table 3: *2004 Active Minnesota Licensed Urban and Rural Physicians*

Specialty	Urban	Percent of Total	Rural	Percent of Total	Total
Family Medicine	1,247	57.5%	922	42.5%	2,169
General Practice	14	61.0%	9	39.0%	23
General Surgery	219	69.3%	97	30.7%	316
Internal Medicine	1,136	82.6%	239	17.4%	1,375
Medicine/Pediatrics	40	83.3%	8	16.7%	48
OB/GYN	316	81.4%	72	18.5%	388
Pediatrics	662	90.0%	74	10.0%	736
Psychiatry	314	77.7%	90	22.3%	404
Other	3,478	89.0%	425	11.0%	3,903
Total	7,426	79.3%	1,936	20.7%	9,362

Source: 2004 Minnesota Physician Workforce Licensure Database, Minnesota Department of Health, Office of Rural Health and Primary Care.

In Minnesota, 41 percent of family medicine physicians provide obstetrical services, according to the *2004 Minnesota Physician Licensure Database, Minnesota Department of Health, Office of Rural Health and Primary Care.* Rural family medicine physicians provide obstetrics at a higher rate (48%) compared to 36 percent of

their urban counterparts. Approximately 75 percent of the urban physicians reported practicing in a clinic setting, while 85 percent of rural physicians reported practicing in a clinic. Of the physicians practicing in a clinic setting, 47 percent are family practice physicians and 42.4 percent are practicing in a rural clinic. Urban physicians reported a hospital practice setting at twice the rate of rural physicians. The majority of physician assistants in rural and urban Minnesota reported practicing in a clinic setting; however, 84 percent of rural physician assistants were in clinics compared to 67 percent of urban physician assistants.

The *Health Workforce Database, Minnesota Department of Health, Office of Rural Health and Primary Care* data used to document the 2002-2004 active, licensed providers is collected by a voluntary survey in conjunction with state licensing boards. Survey response is voluntary and the rate varies from 70 percent for nurses to 90 percent for physicians. Minnesota has a total of 36,005 licensed registered nurses, 744 nurse practitioners, 697 physician assistants, 1,791 dentists, and 4,726 pharmacists. The majority of these providers practice in urban Minnesota (Table 4).

Table 4: *2004 Active Minnesota Licensed Urban and Rural Health Care Providers*

Provider	Urban	Percent of Total	Rural	Percent of Total	Total
Registered Nurse	25,564	71.0%	10,441	29.0%	36,005
Nurse Practitioner	558	75.0%	186	25.0%	744
Physician Assistant	456	65.4%	241	34.6%	697
Dentist	1203	67.0%	588	33.0%	1,791
Pharmacist	3081	65.2%	1645	34.8%	4,726

Source: 2004 Minnesota Health Workforce Licensure Database, Minnesota Department of Health, Office of Rural Health and Primary Care.

Of the registered nurses that responded to the Minnesota Registered Nurse Licensure survey, the most frequent practice setting reported for rural and urban nurses was a hospital. A higher proportion of registered nurses work in nursing homes, home health, and public health in rural Minnesota, whereas urban registered nurses reported hospital, rehab, insurance, and clinic settings more frequently. For rural dentists, solo practice accounted for 57 percent of the reported practice settings compared to urban at 41 percent. Urban dentists reported group practice and other settings including

education, hospital, institution, and HMO more frequently compared to rural dentists.

The individual Minnesota licensing board was contacted to obtain the number of emergency medical technicians in Minnesota. Significantly more emergency medical providers were located in rural Minnesota; however compared to urban areas, a higher proportion of rural providers were first responders (Table 5).

Table 5: *Emergency Medical Providers in Minnesota*

Emergency Medical Providers	Rural	Percent of Total	Urban	Percent of Total	Total
First Responders	10,310	61.2%	6,531	38.8%	16,841
EMT Basic	6,586	62%	4,036	38%	10,622
EMT Intermediate	197	76.7%	60	23.3%	257
Paramedic	1,198	56.7%	916	43.3%	2,114
Total	18,291	61.3%	11,543	38.7%	29,834

Source: Minnesota Emergency Medical Services Regulatory Board, 2005. Currently registered and certified. Self-reported and may report home address, business address or ambulance service address. Reported by county; numbers for the cities of Duluth, Rochester, and St. Cloud are not available.

Minnesota colleges and universities graduate a significant number of health care providers. Nursing, however, is the only provider type that offers health care provider education programs in rural and urban Minnesota (Table 6).

Table 6: *2005 Minnesota Health Care Provider Graduates*

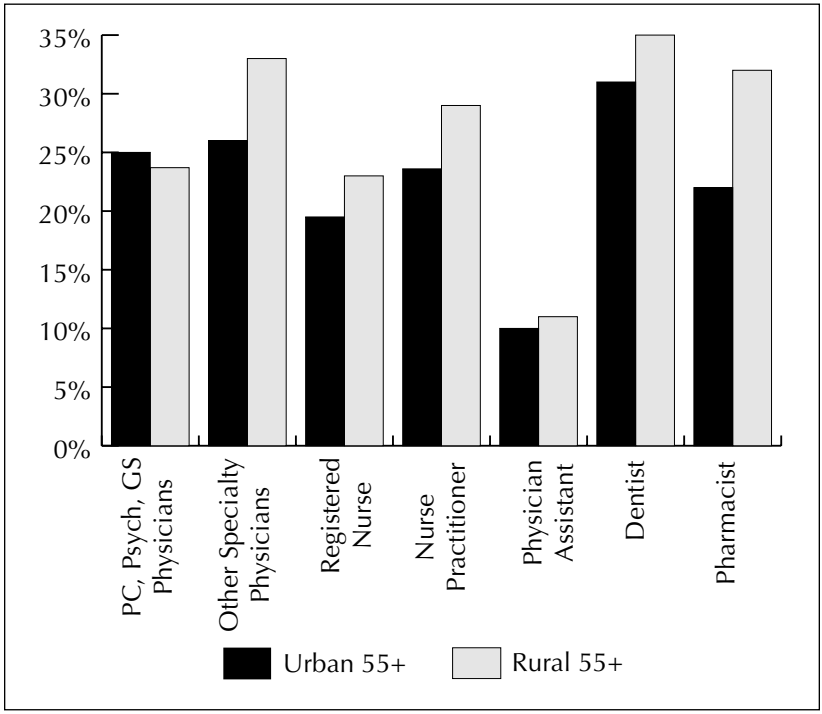
Provider Type	Number of 2004 or 2005 Graduates
Medical Doctors	265
Pharmacists	99
Dentists	82
Registered Nurses*	2,302
Licensed Practical Nurses	1,429
Other Nursing**	220

Source: Mayo Medical School and University of Minnesota Medical School, School of Dentistry and College of Pharmacy; CUPPS, 2003 and 2004 data from IPEDS Peer Analysis System.
* Only RN
** Includes other Post RN programs including Nurse Practitioner and Nurse Anesthetist

The percentage of selected health care providers in Minnesota age 55 years of age and over is shown in Figure 1. Except for primary care, psychiatry, and general surgery physicians, a higher portion of rural providers were age 55 or older. Over 30 percent of other specialty physicians, dentists, and pharmacists were age 55 and over in 2004. This indicates that one-third of the rural workforce will retire in the next 10 years.

The Minnesota Department of Health, Office of Rural Health and Primary Care utilizes the federal government's criteria to determine shortages of health care professionals based on population-to-practitioner ratios, geographic distances, and income. The Minnesota Department of Health also works with the Shortage Designation Branch, Bureau of Health Professions, to establish Health Professional Shortage Area (HPSA) designations, which are a prerequisite to apply for National Health Service Corps recruitment assistance. In 2005, 56 rural counties and five urban counties in Minnesota are partially or fully designated as Primary Care Health Professional Shortage Areas (HPSAs), indicating less than one primary care physician to 3,500 people and lack of access to physician care in contiguous areas (within 30 minutes travel time; to view a map, visit www.health.state.mn.us/divs/chs/PCHPSAFeb05.jpg). Most of the full-county HPSAs are located in northern and western Minnesota. Nearly the entire state of Minnesota, outside metropolitan Minnesota, is designated as a

Figure 1: *2004 Active health care providers age 55 and over.*



Source: 2004 Minnesota Healthcare Workforce Licensure Databases, Minnesota Department of Health, Office of Rural Health & Primary Care.

Mental Health Professional Shortage Area, determined by less than one psychiatrist to a population of 30,000.

As shown in Table 7, rural Minnesota hospitals, those in non-Metropolitan Statistical Areas, have fewer beds, a shorter average length of stay, and fewer patients.

Table 7: *Rural Minnesota Hospital Profile*

Hospital Factor	Rural	Minnesota
Licensed beds	3,819	16,390
Average length of stay	3.6	4.3
Average daily census	1,090	6,952
Emergency room visits	412,107	1,496,810

Source: Minnesota Department of Health, Health Care Cost Information System and Minnesota Hospital Association, Minnesota Hospital Profiles, 2003.

Rural Minnesota, as defined by the 80 counties outside of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington, and the cities of Duluth, Rochester, and St. Cloud, includes 105 hospitals, or 78 percent of the 135 acute care hospitals in the state. The majority of these hospitals are non-profit organizations. Over 70 percent are licensed for less than 50 beds (Table 8).

Table 8: *Rural Minnesota Hospital Ownership*

Type of Ownership	Number	Percent of Total
Not-for-profit	57	54.3%
County	4	3.8%
City/County	3	2.9%
Religious	7	6.7%
Hospital District	15	14.3%
Total	105	100%

Source: Minnesota Department of Health, Hospital Annual Report 2003 and American Hospital Association

Rural Minnesota hospitals were reported to have a higher percentage (46.2%) of patient charges from Medicare compared to all hospitals in Minnesota (35.1%) and a lower percentage of managed care (14.5%) (Table 9).

Table 9: *Payer Mix of Minnesota Hospitals*

Payer Mix	Rural	Minnesota
Medicare	46.2%	35.1%
Medicaid	7.9%	7.8%
Managed Care	14.5%	38.0%
Other Patient Charges	31.4%	19.1%

Source: Minnesota Department of Health, Health Care Cost Information System and Minnesota Hospital Association, Minnesota Hospital Profiles, 2004

Since 1987, 33 hospitals have closed in Minnesota, 76 percent of which were rurally located (*Minnesota Hospital Association, Key Facts About Minnesota Hospitals*, www.mnhospitals.org, *October, 2005).* The Medicare Rural Hospital Flexibility Program, established in the Balanced Budget Act of 1997, authorized designation of Critical Access Hospitals (CAHs). This federal program was designed to decrease the number of hospital closures in rural areas in order to

maintain access to primary and emergency health care services. Minnesota currently has 72 CAHs *(Minnesota Department of Health, Office of Rural Health and Primary Care, Profile of Rural Hospitals in Minnesota, April 2003).* Critical Access Hospital designation allows for cost-based Medicare reimbursement and out-patient Medicaid reimbursement in Minnesota, which helps the financial stability of low-volume hospitals. Most CAHs do not reduce services upon conversion, according to the Flex Monitoring Team, the research and evaluation program for the Medicare Rural Hospital Flexibility Program. (*Flex Monitoring Team Briefing Paper No. 5, Scope of Services Offered by Critical Access Hospitals: Results of the 2004 National CAH Survey, March 2005*, http://flexmonitoring.org/documents/BriefingPaper5_ScopeofServices.pdf).

Compared to urban areas, rural Minnesota has a higher proportion of health care facilities, including community health centers, nursing homes, and ambulance services (Table 10).

Table 10: *Health Care Facilities in Minnesota*

Facilities in Minnesota	Number of Rural Facilities	Percent of Total	Number of Urban Facilities	Percent of Total	Total Number of Facilities
Community Health Centers	11	78.5%	3	21.4%	14
Nursing Homes	269	65.8%	140	34.2%	409
Rural Health Clinics	69	100%	0	0%	69
Ambulance Services	266	85.8%	44 (Metro)	14.2%	310

Source: Minnesota Department of Health, 2005 and A Quiet Crisis: Minnesota's Rural Ambulance Services at Risk, Minnesota Department of Health, December 2002.

Eighty-five percent of the Emergency Medical Services (EMS) are located outside the urban areas of Minnesota. Seventy-seven percent of rural ambulance personnel are volunteer, compared to 23 percent in urban Minnesota, according to the *Minnesota Ambulance Service Surveys 2002, Office of Rural Health and Primary Care, Minnesota Department of Health and the Emergency Services Regulatory Board.*

The challenges presented by the geography of rural Minnesota magnify the difficulty of maintaining emergency medical systems,

mental health systems, and access to primary and specialty care. Brainerd is essentially the geographic center of a state that must deal with long distances, blizzards, sparse populations, and near-mountainous terrain. Thus emergency care and stabilization — and ability for patients to access medical care in their private automobile — may be compromised.

Rural Minnesota, especially northeast Minnesota and the lake areas, are very popular tourist sites. These regions have great difficulty in establishing, financing, and maintaining an EMS base. There is often lack of adequate numbers of EMS volunteers to maintain these systems, let alone enhance their skills and services to advanced care and paramedic levels. Inadequate funding makes it difficult to support emergency access, health care access, and satellite clinics. Maintenance of an adequate cadre of health care providers to share call and work load is vital to avoid burnout. The financial stress of maintaining and establishing clinics, satellite clinics, electronic health records, computer systems, telemedicine systems, and other necessities of business threatens many of the independent and small clinics in rural Minnesota.

Medical students are demonstrating a decreasing interest in family medicine, as seen in the decline from 2,905 to 2,292 students from 1997 to 2005 (*American Academy of Family Physicians,* "Family Medicine Positions Offered and Filled in March, 1993-2005," www.aafp.org, October 2005). An additional issue is medical school costs. For example, the University of Minnesota is the most expensive public medical school, at approximately $25,000 per year for tuition and fees (https://www.meded.umn.edu/financial/student_budget.cfm). These expenses, when added to the cost of living, leave students attending the University of Minnesota with debt loads averaging $100,000–$150,000. This makes it financially difficult for a physician to practice family medicine, psychiatry, pediatrics, and internal medicine, and may result in the choice of a more lucrative subspecialty field. The broad nature of family medicine training necessary for rural practice makes graduates from family medicine residencies attractive to non-rural practices and increases the competition for rural physician recruitment.

Medical leadership (educational and professional) recognizes the need to train more medical students. It has been suggested that medical school enrollment be increased annually by 15 percent over the next decade (AMednews.com, "Physician Shortage? Push is on for more Medical Students," American Medical Association, March 14, 2005). Concern has arisen that most specialties are too heavily trained in hospitals. The hospital of the future may become more

of a virtual hospital with increasing care at home and other clinical settings assisted by technology and health care teams. The increased emphasis on improved quality and performance in chronic disease care should improve quality of life and maintenance of independent living. Whether money will follow to support change, as has been recommended by citizen and professional groups, remains to be seen.

The Institute of Medicine *(IOM)* released a report in November 2004, *Quality Through Collaboration: The Future of Rural Health*. It was written by a committee of a dozen individuals representing rural health care providers, health systems, researchers, and medical schools. Included was Dr. Clint MacKinney, a family practitioner and ER physician from St. Cloud, Minnesota; Dr. Ira Moscovice from the University of Minnesota; Linda Watson, MLS, formerly from the University of Virginia and now Director of the Health Sciences Libraries at the University of Minnesota; and Dr. Mary Wakefield from the University of North Dakota School of Medicine, who chaired the committee. Janet Corrigan of IOM served as lead staff. The committee's charge was to:

- Assess the quality of health care in rural areas.
- Develop a conceptual framework for a core set of rural services.
- Recommend priority objectives and methods of achieving them.
- Consider implications for federal programs and policies.

The new IOM report suggests a five-pronged strategy to address quality challenges in rural communities:

1. Adopt an integrated, prioritized approach to addressing both personal and population needs at the community level.
2. Establish a stronger quality improvement support structure to build rural quality improvement (QI) knowledge and improvement tools.
3. Enhance the human resource capacity of the rural health system through education and deployment.
4. Monitor rural health systems and help to secure the necessary capital for system redesign.
5. Invest in building an information system infrastructure in rural communities that will enable quality information collection and analysis.

For medical providers practicing in rural Minnesota, many of the initiatives to monitor and report health care quality have not been relevant or practical. Rural health care providers practice under different circumstances and utilize different health care delivery models than their urban counterparts. Although the differences are partially due to geography, they are also the result of both medical resource limitations and the low-volume environment.

To be meaningful, quality of care in small, rural hospitals and clinics must be evaluated by measures specifically designed for their environment. Rural is not small urban, and quality assessment must be based on what is appropriate in the rural setting. While many of the quality improvement issues of health care, such as medication errors and infection control, are universal, rural health care is diverse and methods must be tailored to fit the circumstances of each rural community.

The reports of the Institute of Medicine, *Health Professions Education: A Bridge to Quality, and Quality Through Collaboration: The Future of Rural Health,* and the Annals of Family Medicine's *The Future of Family Medicine* make recommendations for increased rural training of professionals and an evolving continuity of care delivery model. The continuity of care delivery model requires physician leadership in continuity teams of care. This will ensure continuity of care for patients who will retain access to personal care by the continuity team, if not their personal physician, with a group of health professionals (physicians, doctors of pharmacy (PharmDs), midlevels, and other health professionals) that work together on a daily basis.

Exercising fiscal constraint and responsibility, rural health care must continue to address individual, family, community, and cultural needs. These social needs have in the past resulted in excellent health care for Minnesotans and have kept the state at the top of national rankings. We must not lose this social agenda.

Mental and behavioral health continue as major and growing concerns throughout most of rural Minnesota. Improvement must be made in diagnosis, assessment, and treatment of these problems with current mental health workers and with greater utilization of family medicine.

Increasing numbers of specialty and subspecialty physicians and emerging technology are providing and enhancing rural care, generally in more populous areas. This has resulted in an evolving sub-regional and rural regional referral center infrastructure that improves local community access.

Better utilization of physician assistants, nurse practitioners,

psychologists, and the future contributions of PharmDs, will further enhance access. Rural communities recognize the need to maximally utilize health care dollars so they are not wasted or duplicated and provide the maximum benefit possible. Rural family medicine should assume an integral leadership role in ensuring the local health care system continues to meet the needs of the community. Accomplishment requires working with peers, administration, patients, and community leaders to assure collaboration in decision making regarding financial, technological, and care delivery issues.

New challenges face rural medical delivery. The pay for performance trend may not be good for rural Minnesota. The basic rural medical system must provide access to care with proper patient triage, evaluation, and referral. Without new money or opt-out provisions, pay for performance runs the risk of underpaying rural delivery systems struggling to provide basic access and risks possible further contraction or loss of these facilities. Other risks of pay for performance include increasing paper burden, increased testing, and diminished reliance on the judgment of seasoned practitioners. It also may encourage a blameless and underreporting environment.

Rural hospitals will continue to undergo profound change. Many smaller hospitals are being rebuilt, hopefully with a vision to the virtual hospital of the future. Rural hospital and clinic capital expenditures accounted for 22 percent ($758 million) of the total spent in Minnesota from 1993 to 2004. The most common expenditures were projects for facility or property acquisitions, construction, or renovation (Minnesota Department of Health, Health Economics Program, "Health Care Capital Expenditures in Minnesota, 1993 to 2004, August 2005").

Rural medical care currently faces workforce pressures. The supply of family and specialty physicians, as well as dentists, physician assistants, and allied health providers, has remained stagnant in the face of a rapidly expanding aging and chronically ill population. Changes occurring in practice styles with better life balance are necessary, but may negatively impact access. For rural Minnesota, the initiatives to recruit local students to health careers and provide basic and clinical education throughout the state, coupled with distance technology, are imperative to maintain or improve current levels of health care access and leadership. Rural Minnesota should consider stepping forward, philosophically and financially, supporting local professional and other workforce students, with assurances on their part of payback through appropriate service or penalties.

As we look to the future, let us not forget that all health care is local. Basic needs of patients, the need for careful listening, personal interaction, recognition of culture and communities, do not change. Health information and other technologies have great potential, e.g., distance education, telecommunication, telemedicine, and even robotic surgery, but we must guard against the threat of impersonalization. Involving patients and communities will ensure greater success as we transition into the future.

As we expand and exert greater efforts to entice rural youth into the healthcare workforce, we will benefit with the assistance, utilization, and support of federal, state, and locally funded workforce programs such as the Area Health Education Centers, National Health Service Corps, primary and secondary education, and higher learning institutions.

Change in health care is inevitable. The challenge for Minnesota rural health care is to anticipate and lead change, ensuring relevancy for the needs of rural communities.

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On a statewide and national level, he has served on many committees and held offices in many organizations, including president of the Minnesota Academy of Family Physicians, the Minnesota Medical Association, and Stratis Health, and as a director, treasurer, and speaker of the house of the American Health Quality Association. As a member of the Minnesota Rural Health Association and a long-time member of the National Rural Health Association, he continues his advocacy locally, regionally, statewide and nationally.