

Primary Care in Minnesota: An Academic Health Center Perspective

**University of Minnesota
January 28, 2008**

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Executive Summary

Current Reality

- Despite ranking very high on many measures of health, Minnesota ranks poorly on health care equity (2007 Commonwealth Fund report), and a large percentage of the state's counties have full or partial designations as medically underserved or as having a shortage of primary care health professionals.
- Minnesota will experience significant demographic change: in 2030, those aged 65 and older will account for 24 percent of the population. Minnesota will be increasingly diverse. Between 2000 and 2005, the white (non-Latino) population grew 2 percent; the non-white population grew 21 percent.
- Physician workforce: Minnesota's overall supply of primary care physicians is as good as or better than many other states, but many rural areas of the state are experiencing physician shortages, and the need for them is expected to increase in both rural and urban areas because of national trends.
- There is evidence for declining interest in primary care practice and increased interest in specialty practice nationally and in Minnesota.
- The nature of family medicine practice has changed dramatically, certainly in Minnesota, and will likely continue to do so. The degree of change has caused angst among family doctors.
- Declining interest in primary care has been associated with perceptions that it is not sufficiently remunerative and with concerns about meeting lifestyle aspirations, degree of intellectual challenge, and managing significant educational debt.
- Minnesota has loan repayment programs for rural and urban primary care and service in a federal HPSA, but a limited number of slots are available each year.

AHC Current Programs for Primary Care Physicians

- The Medical School, through its two campuses in the Twin Cities and Duluth, is the primary source of the physician workforce for the state.
- The Medical School educates skilled, compassionate, and socially responsible physicians who will meet the needs of diverse populations across the state. The Duluth campus has a special commitment to educate students who plan to practice family medicine and other primary care specialties in rural Minnesota and American Indian communities.
- In the recent past, total class size has numbered 220, with 50 of those students spending their first two years on the Duluth campus. This year, total class size is 241.
- The Medical School supports robust programming to recruit students to the Medical School and then provides an array of required and optional experiences that expose students to primary care in urban underserved and rural communities, including the Rural Physician Associate Program (RPAP, launched in 1971), a nine-month commitment.

- Of the 892 RPAP participants who currently practice medicine, 575 (64 percent) are practicing in Minnesota. Of these, 361 (63 percent) are in rural communities, and nearly all are in primary care (89 percent).
- Minnesota ranks eighth in the nation for retaining physicians who graduate from medical school here.
- Over the last five years, 511 (47 percent) of U of M Medical School graduates chose and matched with a primary care residency, including 62 percent of students who began at Duluth (n=160) and 42 percent who began in the Twin Cities (n=351).
- From 2001-2006, 76 percent of graduates from University of Minnesota family medicine residency programs chose initial practice sites in Minnesota (n= 204).

New Models of Primary Care

- Traditional models of primary care have limitations, including an emphasis on acute illness treatment over longitudinal whole person orientation and suboptimal use of physician time and effort.
- The limited success of current models of care in improving the health of the community has stimulated strong interest in new models of care across the community and country.
- Other models of care, including the “medical home” concept and the Wagner Chronic Care Model, have been developed and are being tested nationally and in Minnesota. The University is an active collaborator with the community in researching and piloting these new models of care.
- New models of care delivery redefine roles for members of the health care team including physicians, pharmacists, nurses, dentists, and public health providers. Health professionals will work in interprofessional teams “at the top of their licenses.”
- Access to high-quality systems – not just health delivery, but systems that support and sustain health and wellness with informatics and technology – is essential to any community. Appropriate use of information technologies by both health professionals and citizens can enhance access to health care knowledge and services in underserved areas.

AHC Proposal for addressing primary care needs in Minnesota

- Strengthen the pipeline for primary care
 - Maintain the 10 percent increase in University of Minnesota Medical School class size (increment of 22 new students).
 - Increase by 10 the number of family medicine residency slots offered each year in Minnesota.
 - Increase economic incentives for primary care, specifically develop more robust loan repayment program for primary care physicians in underserved communities.
 - Explore opportunities to engage foreign medical graduate immigrant talent.
 - Support retraining for previously licensed Minnesota physicians.

- Provide sustained funding for effective educational models to train primary care physicians for underserved communities. Specifically, provide support for:
 - RPAP to support community preceptors who work with students for nine months and to expand the program.
 - Development of a comparable urban longitudinal learning program and support for its community preceptors.
- In partnership with health systems, educational institutions, policy makers, payors/insurers, and community:
 - Advocate for improved primary care provider reimbursement and programs to recruit and retain primary care physicians.
 - Develop interprofessional, community-based health delivery models that emphasize use of evidence-based information, prevention, wellness and health promotion.
 - Build a body of evidence and scholarship about the effectiveness of new models that includes evaluation of patient safety, outcomes, and quality of care.
 - Leverage use of information technologies such as telemedicine, access to the Internet, and participation in the state's E-Health Initiative to improve health quality and access in underserved areas and to empower Minnesotans to participate more fully in their own health.

Conclusion

Minnesota's primary care systems require attention. Too many Minnesotans do not have ready access to primary care, especially those who live in underserved rural and urban communities. Training more doctors in the old model is not a viable solution – we will need to strengthen our pipeline of primary care physicians, develop robust educational opportunities in rural and underserved health care, explore new models of care, and engage in substantive dialogue with all stakeholders to develop viable systems for health care delivery for all Minnesotans.

Introduction

This white paper documents the current state of primary care in Minnesota and articulates the approach the University of Minnesota Academic Health Center would like to embark on in partnership with others to address current and anticipated workforce shortages and to enhance the vitality of primary care across the state.

The Academic Health Center prepares 70 percent of Minnesota's health professionals – physicians, advanced practice nurses, pharmacists, dentists, veterinarians, and public health professionals. The University of Minnesota Medical School is the only public medical school in the state and has a distinguished track record in preparing primary care physicians for Minnesota. In particular, the school's Duluth campus specific mission is to train primary care physicians to meet the needs of rural Minnesota and American Indian communities.

Primary care is commonly defined as family medicine, internal medicine, pediatrics, medicine/pediatrics, and obstetrics and gynecology. Given Minnesota's reliance on family medicine physicians, particularly in rural Minnesota, the focus of the Medical School's Duluth campus on family medicine, and the availability of data that tracks students through residency and into practice, we have chosen to focus much of this paper's discussion on family medicine.

This paper was written at the request of the senior vice president for health sciences and responds to increased discussion throughout the state, at the legislature, in the governor's office, and in the populace about the quality of health care and how health care could be transformed to support better health across the state's communities and to address spiraling health care costs, which threaten individuals, families, and employers. Primary care has been an important thread in these discussions.

Our overview of the state of primary care in Minnesota reveals real problems with the distribution of health professionals, including primary care providers, across the state as well as concerning and persistent health disparities. It also reveals declining interest in family medicine as a career; primary care physicians under stress; and, increased innovation and exploration into new models of care that will better meet primary care health needs through a variety of mechanisms, including new ways of using information technology to support both providers and patients and changing roles for other health professionals, including nurse practitioners and pharmacists.

The time is right to take actions that will strengthen the pipeline for primary care and to begin coordinated conversations across the state about new models of care that will better meet our collective needs. The Academic Health Center is ready to convene and coordinate those conversations. We are also prepared to enhance and expand our existing successful programs that prepare primary care physicians and support innovative, new models that will advance teamwork across the health professions.

Current Reality

Snapshot: The health of Minnesotans

Since 1990, Minnesota has ranked among the top two “healthiest” states by the American Health Rankings™, and for 11 of those years has been ranked number one. Minnesota’s strengths include ranking first for a low rate of cardiovascular deaths, a low premature death rate, and a low percentage of uninsured population. It is also in the top five states with a low percentage of children in poverty, a low infant mortality rate, a low occupational fatalities rate, a low rate of motor vehicle deaths, and a high rate of high school graduation. Minnesota’s biggest challenges are a high prevalence of obesity, limited access to adequate prenatal care, a moderate violent crime rate, and a high prevalence of smoking.¹

In 2007, a large percentage of Minnesota counties carried a full or partial Health Professional Shortage Area (HPSA) or Medically Underserved Area (MUA) designation in primary care, mental health, and dentistry. (Table 1) The federally defined primary care specialties are doctors of medicine (M.D.) and doctors of osteopathy (D.O.) who practice in: general or family practice, general internal medicine, pediatrics, and obstetrics and gynecology.²

Table 1: Minnesota Health Professional Shortage Areas and Medically Underserved Areas

Shortage Area Designation (date)	Number of Full County Designations	Number of Partial County Designations	Total County Shortage Designations/Total Counties	Percent Designated
Primary Care HPSA (04.07)	26	28	54/87	62.1%
Dental HPSA (02.06)	29	12	41/87	47.1%
Mental Health HPSA (05.07)	70	0	70/87	80.5%
MUA (01.06)	26	35	61/87	70.1%

The HPSA designation is the federal government’s formal recognition of workforce need. The designation is comprised of three major components of the federal HPSA criteria, including 1) rational service area, 2) population-to-provider ratio, and 3) accessibility of populations to primary care resources in surrounding areas. MUA designation is similar in that it focuses on primary care but considers a broader set of criteria, including 1) ratio of primary medical care physicians per 1,000 population, 2) infant mortality rate, 3) percentage of the population with incomes below the poverty level, and 4) percentage of the population age 65 or older. Counties or partial county governmental entities work with the Minnesota Department of Health Office of Rural Health and Primary Care

¹ America’s Health Rankings, 2007 Edition. United Health Foundation.

² Primary Medical Care Designation Criteria. Health Professional Shortage Area Bureau of Health Professions. Retrieved on January 17, 2008, from <http://bhpr.hrsa.gov/shortage/hpsacritpcm.htm>.

(MDH ORHPC) to apply for HPSA designations. HPSA designation is not awarded automatically, and groups typically need to value the potential benefit of the designation compared with the required processes and the cost of application. As a result, it is likely more areas of Minnesota experience actual workforce shortages than are formally designated.³

Changing demographics

The number of Americans age 65 years and older will double by 2030 and will represent 20 percent of the population.⁴ In Minnesota, between the years 2000 and 2030, the 65 and older population will increase from 12 percent to 24 percent of the total state population. The 65 and older population is currently the fastest growing age group in the state.⁵ Older Americans use far more physician services than their younger counterparts. The elderly account for a disproportionate share of hospitalizations, procedures, and high-intensity services. Additionally, most chronic illnesses are much more prevalent among the elderly. Although new advances in treatment and early screening should bring improved outcomes, the prevalence of chronic diseases will increase over time. Patients are likely to live longer and will do so with multiple conditions, requiring ongoing physician services.⁶

The non-white population in Minnesota has changed dramatically over the past several years. Between 2000 and 2005, the non-white population grew 21 percent, compared with the 2 percent increase for the white (non-Latino) population. A contributing factor to this population growth and diversification is international immigration and refugee resettlement. Refugee arrivals in Minnesota in 2005 comprised 11.8 percent of all refugees entering the U.S. In 2005, 40 percent of all immigrants to Minnesota came from Africa, and 28 percent came from Asia.⁷

Minneapolis has 8 percent of the state's total population, but 38 percent of the state's populations of color. In Minneapolis, infant mortality rates in the African American community are three times higher than whites; rates among American Indians are almost four times higher than whites.⁸ From 1995-2000, reported cases of tuberculosis increased by 65 percent. The heart disease mortality rate in Minneapolis is one-third higher than that of the state.⁹

Despite Minnesota's consistently high ranking for health nationwide, not everyone has shared in this good health. A report published by the Commonwealth Fund in 2007 rated

³ Educating Minnesota's Future Health Professions Workforce: 2008 Update. Barbara Brandt and Kaia Sjogren, University of Minnesota Academic Health Center. January 2008.

⁴ Demographics of an Aging Population, Minnesota Department of Health, Fall 2005.

⁵ Demographics of an Aging Population, Minnesota Department of Health, Fall 2005.

⁶ Salsberg, E., Grover, A. (2006). Physician workforce shortages: Implications and issues for academic health centers and policymakers. *Academic Medicine*, 81 (9), 782-787.

⁷ 2007 Eliminating Health Disparities Legislative Report. Minnesota Department of Health. January 2007.

⁸ Health Disparities in Minneapolis: Populations of Color and American Indians. Minneapolis Department of Health and Family Support. March 2006.

⁹ Health Disparities in Minnesota. Retrieved on December 6, 2007 from <http://www.ci.minneapolis.mn.us/legislativeaffairs/HealthDisparities.asp>.

Minnesota 38th overall in equity rankings in health care. This poor ranking was a result of large disparities seen among minority groups, specifically Asian Americans and Native Americans living in Minnesota.¹⁰ The documented health disparities in the state's minority and tribal communities include shorter life spans, poorer general health, higher rates of infant mortality, and higher incidences of diabetes, heart diseases, and cancer. Recent data indicate that these long standing disparities continue and in a few cases are getting worse, not better.¹¹

Rural Minnesota

Rural Minnesotans face the same challenges to their health as the rest of the population, however their struggles are often magnified because they lack access to “core health care services.”¹² Rural Minnesota has 80 percent of the state's land area and 30 percent of the total population. Thirty-seven percent of Minnesota's rural population lives in a Health Professional Shortage Area (HPSA) or a Medically Underserved Area (MUA).¹³ Rural Minnesota is also experiencing rapidly changing demographics. Forty-one percent of those 65 and older live in rural Minnesota. All counties where more than 20 percent of the population is 65 and older are in rural Minnesota. In addition to the aging population, rural Minnesota is experiencing significant growth in minority and immigrant populations. Much of the growth has been attributed to the employment opportunities provided by manufacturing and food processing plants located in rural counties. Between 1990 and 2000, the rural Hispanic population increased by 176 percent and the African American population by 178 percent.¹⁴ The changing cultural landscape makes it challenging for rural hospitals and clinics to provide culturally appropriate care.

When comparing health status indicators between urban and rural residents in Minnesota, a number of differences exist. For example, rural residents are more likely to smoke, be overweight, and not participate in leisure-time physical activity. Additionally, rates of motor vehicle death and unintentional injuries are higher. Elderly rural residents are nearly half again as likely to suffer tooth loss as their urban counterparts and are twice as likely to have not visited a dentist or dental clinic in five or more years. Employment trends in rural Minnesota can be characterized as low-wage, part-time, and seasonal jobs, resulting in higher rates of uninsurance. In 2006, only 54.5 percent of businesses located outside the Twin Cities offered health coverage.¹⁵

Physician workforce

¹⁰ Aiming Higher. Results from a State Scorecard on Health System Performance. The Commonwealth Fund. June 2007.

¹¹ 2007 Eliminating Health Disparities Legislative Report. Minnesota Department of Health. January 2007.

¹² Quality Through Collaboration: The Future of Rural Health Care. Institute of Medicine. November 2004.

¹³ Health Care Reform: Addressing the Needs of Rural Minnesotans. Minnesota Department of Health Office of Rural Health and Primary Care. October 2007.

¹⁴ Health Care Reform: Addressing the Needs of Rural Minnesotans. Minnesota Department of Health Office of Rural Health and Primary Care. October 2007.

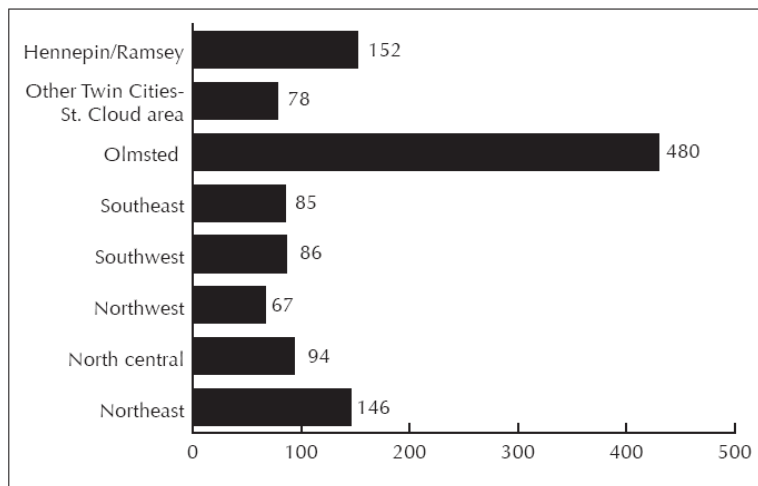
¹⁵ Health Care Reform: Addressing the Needs of Rural Minnesotans. Minnesota Department of Health Office of Rural Health and Primary Care. October 2007.

The Minnesota Department of Health (MDH) Office of Rural Health and Primary Care surveys physicians regarding employment status and the nature of their practices each year when they renew their licenses. In 2002, there were 4,261 primary care physicians licensed and practicing in Minnesota. Of those, 1,286 (30 percent) were practicing in rural Minnesota.

Twenty-eight percent of all physicians are women. However, 59 percent of female physicians in Minnesota report primary care as their principal specialization, compared with 42 percent of male physicians.¹⁶

Primary care physicians represent the largest proportion of physicians practicing in Minnesota. In 2007, 49 percent of Minnesota physicians claimed a primary care discipline as their principal specialty (family medicine, internal medicine, pediatrics, and obstetrics/gynecology)¹⁷. The breakdown is as follows: 23 percent were in family medicine, 12 percent in internal medicine, 9 percent in pediatrics, 4 percent in obstetrics/gynecology.¹⁸

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



In 2003, Minnesota had 76 active primary care physicians per 100,000 population, higher than the national ratio of 69:100,000.¹⁹

The geographic distribution of physicians is critical to health care access. The distribution of physicians in urban and rural areas differs depending on which counties are defined as urban and which are defined as rural.

The percentage of health care delivered by primary care physicians varies in rural, micropolitan, and urban Minnesota.²⁰ Seventy-seven percent of rural physicians are

¹⁶ The Minnesota Health Workforce: Highlights from the Health Workforce Profile. U.S. Department of Health and Human Services Bureau of Health Professions. 2004.

¹⁷ Fonkert, J. *Rural Minnesota's Health Care Workforce: Demographics, Geography and Strategies*. Rural Minnesota Journal, Spring 2007.

¹⁸ Minnesota Physician Facts and Data 2005, Minnesota Department of Health Office of Rural Health and Primary Care.

¹⁹ The Minnesota Health Workforce: Highlights from the Health Workforce Profile. U.S. Department of Health and Human Services Bureau of Health Professions, 2004.

²⁰ 2004 Geographic Distribution of Minnesota Physicians. Minnesota Department of Health Office of Rural Health and Primary Care. October 2005.

primary care physicians, compared with 57 percent of physicians in micropolitan counties and only 44 percent of physicians in metropolitan counties.²¹

The number of primary care physicians in Minnesota grew by 20 physicians between 1999 and 2002, increasing the supply from 4,241 to 4,261. The number of other specialty care physicians rose by 129 (6 percent) during the same time period.²² A similar trend has been demonstrated nationally, with the rate of growth in subspecialty physicians far exceeding the rate of growth in family medicine and other primary care specialties in the last 25 years. Specialists accounted for more than three-fourths of the growth in the physician (per capita) workforce from 1980 to 1999, despite concerted, widely publicized policy and funding efforts to increase the number of primary care physicians. During that time period, the number of family physicians grew 0.3 percent, general internists rose 8 percent, and general pediatricians 7.5 percent while the production of other physician specialists grew by 41 percent.²³

The demand for family medicine physicians nationally has grown in recent years. Merritt Hawkins & Associates, a leader in physician search and recruitment reported an 84 percent growth in the number of family practice search assignments in the last five years. Family physicians were at the top of the recruitment list for the first time in six years, passing orthopedic surgeons, cardiologists, and radiologists. Increased salaries and incentive programs are also being seen nationally as a recruitment tool for family physicians.²⁴ In 2007, 91 health care employers in Greater Minnesota reported that they had 168 physician vacancies and were recruiting 284 physicians. Primary care accounted for 56 percent of the physician vacancies and positions under recruitment.²⁵

According to the Association of American Medical Colleges, Minnesota's track record in retention of Medical School graduates and residents in the state is notable. Minnesota ranks eighth in the nation for retaining practicing physicians who completed medical school in-state, retaining 53 percent of all medical school students compared to the nation's median of 40 percent. Additionally, Minnesota ranks seventh in the nation for active physicians in the state who also completed residencies/fellowships within the state. Nearly 55 percent of all active physicians were trained in the state; the nation's median is 45 percent.²⁶

In 1997, nearly 400 family medicine residency programs across the country attracted 2,340 U.S. medical school (M.D.) seniors through the National Residency Matching Program, representing 17.3 percent of U.S. medical school graduates. In the 2003 match,

²¹ 2004 Geographic Distribution of Minnesota Physicians. Minnesota Department of Health Office of Rural Health and Primary Care. October 2005.

²² Buck, S.T., Trauba, V., & Christensen, R.G. (2004, September). Minnesota physician workforce analysis: rural supply and demand. *Minnesota Medicine*, 40-43.

²³ Biola, H., Green, L.A., Phillips, R.L., Guirguis-Blake, J., & Fryer, G.E., for the Robert Graham Center. (2003). The US primary care physician workforce: minimal growth 1980-1999. *American Family Physician*, 68, 1486.

²⁴ 2007 Review of Physician and CRNA Recruiting Incentives. Merritt Hawkins and Associates.

²⁵ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

²⁶ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

1,234 U.S. medical school seniors chose family medicine, a decline of nearly 50 percent in a period of only six years.²⁷ The declining interest in primary care has been associated with new generational student perceptions that primary care is not sufficiently remunerative and that its demands are not compatible with their lifestyle expectations.²⁸ Recent surveys of students also demonstrate a decline in valuing primary care's "intellectual stimulation" ("Is my work interesting and challenging?"), meaning "Am I contributing to the greater good of individuals and society?"²⁹

Changing face of primary care physician practice

In the last three decades, Minnesota has been a national leader in developing integrated delivery systems. The introduction of managed care and health maintenance organizations brought new responsibilities for primary care physicians. In the 1980s, primary care practices found they needed to sign agreements accepting financial risk for patients' health care costs, and their physicians became "gatekeepers." These were complex and fundamentally different roles than many physicians had trained to do and caused significant consternation. Then, health insurance models changed again, as a public backlash against capitation caused development of new financing plans. Declining reimbursements to primary care physicians drove expectations to see more patients in less time. Now, insurers and purchasers of health care are implementing "pay for performance" initiatives involving public data reporting on physician performance measures. Successful performance on these measures requires physicians to develop new models of care delivery, requiring substantial learning and difficult change. All of these factors contributed to significant angst and disillusionment among this group of physicians. Interestingly, a pattern of migration out of the region was documented. Between 1981 and 2003, 13 percent of actively practicing primary care physicians moved from one region of the country to another. The midwest region had the highest outflow, with 18 percent of the workforce moving out of the region.³⁰

Financial factors influencing primary care practice

In 2006, Minnesota was identified as the second most expensive of 74 American public medical colleges with resident tuition and fees of \$32,147. According to the Association of American Medical Colleges, the average educational debt of medical graduates of the class of 2007 (including pre-med borrowing) was \$137,437.³¹ The average indebtedness level for 2007 graduates of the University of Minnesota Medical School was \$141,691.

²⁷ Martin, J.C., Avant, R.F., Bowman, M.A., et al, Future of Family Medicine Project Leadership Committee. (2004). The Future of Family Medicine: A collaborative project of the family medicine community. *Annals of Family Medicine*, 2, (suppl 1), S3-S32.

²⁸ Whitcomb, M.E., Cohen, J.J. (2004). The future of primary care medicine. *The New England Journal of Medicine*, 351 (7), 710-712.

²⁹ Rueben, D.B. (2007). Saving primary care. *The American Journal of Medicine*, 120 (1), 99-102.

³⁰ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

³¹ Medical Student Debt. Association of American Medical Colleges. Retrieved on August 12, 2007 from <http://www.ama-assn.org/ama/pub/category/5349.html>.

In a 2005 national survey of physicians completing family practice residencies, respondents reported a median debt of \$163,000.³²

Nationally, salaries for primary care physicians are significantly lower than for many specialty physicians. In 2007, median salaries in family medicine were reported at \$185,730, with general internal medicine at \$193,162. Median salaries for non-primary care specialties were much higher. For example, the median salary in specialty cardiology fields ranged from \$389,243 to \$435,000, while the median salary for orthopedic surgery was \$436,481. The median salary for a family physician in the West North Central Census Division, which includes Minnesota, was \$170,000.³³

There are numerous federal, state, and local programs and state health service loan repayment initiatives that are intended to recruit and retain primary care physicians in rural and urban underserved areas, however, workforce shortages remain. Given the economic concerns of high educational debt and lower compensation for family medicine physicians relative to other specialties, loan repayment programs are a sensible strategy to encourage physicians to enter primary care and to practice in underserved areas.

A national survey demonstrated that compared with non-obligated physicians, physicians serving obligations to state programs are more likely to practice in demonstrably needier communities, care for more Medicaid and uninsured patients, and remain longer at their practice sites.³⁴ Additionally, state loan repayment programs have been shown to positively affect the recruitment and retention of rural primary care physicians. Primary care physicians in Minnesota have options for national and state funded loan repayment programs. Minnesota currently has two loan repayment programs for which primary care physicians may qualify: the *Minnesota Rural and Urban Physician Loan Forgiveness Program*, which is funded entirely with state dollars, and the *Minnesota State Loan Repayment Program*, jointly funded by the federal National Health Service Corps and the state.

The *Minnesota Rural and Urban Physician Loan Forgiveness Program* is part of a state umbrella loan forgiveness program that aims to improve the distribution of health care practitioners in high-need settings. Other eligible health professionals include rural midlevel practitioners, nurses in nursing homes, rural pharmacists, dentists, and allied health and nursing faculty. The commissioner of health distributes funds annually proportionally among eligible health professions according to the vacancy rates of each profession. The physician loan forgiveness program requires a physician to be practicing family medicine, pediatrics, internal medicine, obstetrics/gynecology, or psychiatry in a designated rural or urban area. Applications to this program are submitted during medical school or prior to/during residency. Participants must practice at the approved

³² Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

³³ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

³⁴ Pathman, D., Konra, T., Taylor, D., and Koch, G. (2004). Outcomes of states' scholarship, loan repayment, and related programs for physicians. *Medical Care*, 42: 560-568.

site for a minimum of three years.³⁵ As of 2007, up to approximately \$17,000 per physician per year will be available. Four to seven physicians per year are usually funded. Most of the physicians in this program practice in rural Minnesota.³⁶ Over the past five years, there has been an average of 24 applicants annually for the program. In 2007, there were 14 applicants for the program, and 108 physicians participated in this program between 1999 and 2007.

The *Minnesota State Loan Repayment Program* requires a physician to practice in a federally designated Health Professional Shortage Area. Up to \$20,000 per year is available for a two-year commitment, with an option for extension. Since 1994, 26 physicians have participated in this program. Eleven of the sites were urban and 15 were rural. As of 2006, 22 physicians remained in their sites beyond their obligation, three did not, and one was still completing a service obligation.³⁷

In a survey of Minnesota physicians who received loan forgiveness, 88 percent reported that the program was important to very important in influencing their decision to practice in a rural area, and 61 percent continued medical practice at their placement site for three or more years following completion of their service obligation.³⁸

AHC current programs for primary care physicians

University of Medical School admissions and recruitment

The University of Minnesota Medical School educates and prepares future physicians for the state. Through its two campuses in the Twin Cities and Duluth and in partnership with the community, the Medical School educates medical students and supports an array of residency training programs in primary and specialty care. In addition, the Duluth campus, which educates approximately 50 students for the first two years of medical school, has a special commitment to educate students who plan to practice family medicine and other primary care specialties in rural Minnesota and American Indian communities. The University of Minnesota Medical School is widely recognized for its success in training future family medicine physicians. In 2006, it ranked second out of 125 medical schools in the number of graduates choosing family medicine and eighth in the percent of graduates choosing family medicine.³⁹

³⁵ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

³⁶ Bringing Health Care to the Heartland: An Evaluation of Minnesota's Loan Forgiveness Programs for Select Health Care Occupations. Minnesota Department of Health Office of Rural Health and Primary Care. April 2007.

³⁷ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

³⁸ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

³⁹ Pugno, P., Schmittling, G., McGaha, A., and Kahn, N. (2007). Entry of US medical school graduates into family medicine residencies: 2006-2007 and 3 year summary. *Family Medicine* 39, 550-561.

In the recent past, total M.D. class size for the Medical School has hovered around 220. In 2007, the school's entering class increased significantly as a result of a higher than expected enrollment rate among accepted applicants, and total class size expanded to 241, a 10 percent increase. Admission to the Medical School is highly competitive.

Both the Twin Cities and Duluth campuses give preference to Minnesota students in the admission process. Over the past six years, the percent of Minnesota residents among medical student entering classes has ranged from 67 percent to 82 percent in the Twin Cities and from 87 percent to 98 percent in Duluth.

Admission processes on the Twin Cities and Duluth campuses are separate. The selection criteria at both campuses require medical students to be academically qualified to complete the medical school curriculum and to demonstrate past experience and commitment of service to others through volunteer or community service activity; a strong motivation for a career in medicine; excellent interpersonal and communication skills, maturity, and compassion; and, the skills and talents necessary to develop mastery of the foundations of a medical education. In addition, the Twin Cities admissions criteria include contributing to the diversity of the medical student body and/or demonstrating a commitment to serving the health needs of a diverse society, and the Duluth criteria include demonstrating a strong motivation for a career in rural family practice or other primary care specialty in a rural area.

To advance its mission to educate skilled, compassionate, and socially responsible physicians who will meet the needs of diverse populations across the state, the Medical School also supports targeted recruitment and pipeline programs, such as the Early Admission Rural Scholars Program at the Duluth campus and Minnesota's Future Doctors, a pipeline program created and supported by the U of M Medical School and Mayo Medical School, described below.

The *Early Admission Rural Scholars Program* provides undergraduate students who have been accepted to the University of Minnesota Duluth (UMD); who demonstrate superior scholastic ability and personal development during their first three academic years of college; and, who are strongly interested in rural primary care, the opportunity to earn a baccalaureate degree and the M.D. degree in seven years (three years of undergraduate and four years of medical school), rather than the typical eight. The program can accommodate up to five students per year who are enrolled at UMD in the College of Science and Engineering.

Minnesota's Future Doctors (MFD), established in 2006, is a three-year pipeline program that aims to develop the premedical skills of Minnesota's high-potential minority, immigrant, rural, economically challenged, and first-generation college students. Each year up to 50 students are selected to participate in programming designed to help them prepare for medical school. Every cohort spends significant time on both the University of Minnesota Medical School and Mayo Medical School campuses. By 2010, it is anticipated that 50 percent of the participants from the two 2007 cohorts will matriculate into medical school. In an effort to help participants understand the importance of rural

and culturally appropriate primary care, they develop community-based health disparities projects, shadow rural and primary care physicians, and discuss the needs of various communities with community advocates.

Educational experiences during Medical School

Medical students experience primary care practice through a mix of required and optional experiences of varying length and intensity. These experiences are provided in close partnership with communities, health care systems, and health care providers across Minnesota.

- *Primary Care Clerkship* is required of all Medical School students. It is an eight-week experience that exposes students to family medicine and primary care, more broadly, in the ambulatory setting.
- The *Rural Observation Experience* (ROE) program provides any first- and second-year medical student at the Medical School Twin Cities campus the opportunity to shadow a rural family physician and see firsthand the rewards and challenges of rural family practice medicine for several days. Students accompany a preceptor at the clinic, on rounds, or at the hospital and nursing homes, and attend any staff meetings or case conferences.
- *Rural Physician Associate Program* (RPAP) is a nine-month, community-based educational experience for University of Minnesota third-year medical students who live and train in rural communities. RPAP students experience hands-on learning as they care for patients of all ages. RPAP was established in 1971 to encourage students to practice in rural areas throughout the state of Minnesota. More than 1,000 students have participated in the program. Approximately 30 to 45 students are placed in Minnesota communities each year. Of 892 RPAP participants who currently practice, 575 (64 percent) are practicing in Minnesota. Of these, 361 (63 percent) are in rural communities, nearly all are in primary care (89 percent). Seventy percent of the 892 participants spent the first two years of medical school in the Twin Cities, and 30 percent began medical school in Duluth.
- *Urban Community Ambulatory Medicine* (UCAM): This four-week optional experience is available to students after they have completed the primary care clerkship. It occurs in an underserved urban community and deepens students' exposure to patient diversity, low income populations, multicultural urban medicine, and community health.
- *Summer Interns in Medicine* (SIM): The SIM program, coordinated by the Duluth campus, offers Duluth and Twin Cities medical students between year one and two the opportunity of a two- to eight-week internship in a rural community. In addition to spending time with a physician, students are exposed to the broad array of people, professions, and services involved in rural health care, for example, emergency room, hospice, home care, pharmacy, public health nursing, law enforcement, and dentistry.

Minnesota Area Health Education Center (MN AHEC)

The Minnesota Area Health Education Center (MN AHEC) plays a key role in facilitating student experiences that take place in rural communities. Established in 2002, MN AHEC works in partnership with communities to address their unique health professional workforce needs. A collaboration with the University of Minnesota Academic Health Center's six health professions schools, Minnesota AHEC includes the statewide program office plus regional AHECs in the northeast, southern, central, and northwest regions. It provides a platform of services to assist students, schools, and communities.

The regions work with AHC faculty and current health professions students to develop new and innovative experiential education activities, identify training sites and community preceptors, coordinate logistics for students, and provide financial assistance to students to help offset the costs associated with relocating to a rural location when fulfilling rural rotations. The Minnesota AHEC regions are all technology-equipped to link through interactive television and the Internet with U of M programs.

Minnesota AHEC supports nearly 300 dentistry students annually by providing housing assistance, facilitating connections to community mentors, and linking students with opportunities to speak at local elementary and high schools during their required community based rotations in Hibbing and Willmar. Twenty Summer Internship in Pharmacy (SIP) students complete four-week internships in local health care facilities annually, and an additional 265 pharmacy students rotate through clinical sites in the regions each year. Fifty advanced practice nursing students including family, women's health, and public health nurse practitioners do extended (14-week) clinical rotations in AHEC regions. Third- and fourth-year medical student rotations (80 per year) occur, and the RPAP (approximately 30 students annually) and SIM (40 students annually) programs also work with Minnesota AHEC. Student support focuses on connecting these students with other health professions students also rotating through AHEC regions.

In addition, Minnesota AHEC facilitates interprofessional education (IPE) projects funded by Medical Education and Research Costs (MERC). These projects center on community identified health issues. The overarching goals of these projects are to increase the number of health professionals practicing in underserved areas of the state, strengthen interprofessional practice, and build and sustain long-term interprofessional education partnerships. Overall, the projects seek to put interprofessional education into practice to the benefit of future health professionals, as well as demonstrate the positive impact of interprofessional care on community health outcomes. Funding for the IPE projects began in 2004 with two communities; in 2005, two communities were added; and in 2006, five new community projects were funded. Minnesota AHEC works with the community to identify student needs and then assists with placing students in the community for rural experiential education.

The Medical School's track record in preparing physicians for Minnesota

More than 70 percent of Minnesota residents who attend the University of Minnesota Medical School remain in Minnesota after completing their education. Minnesota also

benefits when Wisconsin and North Dakota residents attend medical school at the U: 60 percent of Wisconsin residents who graduate from the University of Minnesota remain in Minnesota to practice; 40 percent of North Dakota residents remain in Minnesota.

Over the last five years, 511 (47 percent) of University of Minnesota Medical School graduates chose and matched with a primary care residency, including 62 percent of students who spent their first two years on the Duluth campus (n=160) and 42 percent of those who began in the Twin Cities (n=351).

From 2003 to 2007, at the University of Minnesota Medical School, the *percentage* of students selecting primary care has declined slightly. Because the number of medical school students has increased at this same time, the absolute number remains approximately 100 graduates entering primary care annually. In absolute numbers and percentage of the graduating class, the Twin Cities-based students selecting primary care has remained relatively constant [2003, 70 (45.2 percent); 2007, 68 (39.5 percent)] while the steepest decline in interest has been experienced in Duluth-based students [2003, 34 (68.0 percent); 2007, 29 (54.8 percent)].⁴⁰ Compared with other medical schools, this decline in interest is very modest. National reports have shown a 50 percent decline in students selecting primary care.⁴¹

In 2006, the University of Minnesota Medical School ranked eighth nationally in the percent of graduates choosing family medicine.

University of Minnesota family medicine residency programs

There are 11 family medicine residency programs in Minnesota. Seven of those programs are affiliated with the University of Minnesota Medical School: University of Minnesota Medical Center, Fairview /Smiley's Clinic, North Memorial, St. Cloud, St. Joseph, St. John's, Methodist, and Mankato. The other four family medicine programs are the Hennepin County Medical Center, Mayo, Duluth Graduate Medical Education Council, and Allina/United Family Medicine programs.

From 2003 to 2007, the total number of family practice residency positions offered in Minnesota ranged from 71 to 94. The rate of residents matching to these positions in the National Resident Match Program (NRMP) varied by site. One site closed during this time period, and a few others reduced or added positions. In 2007, 72 of the 78 positions offered (92 percent) were filled in the NRMP, and an additional five positions (6 percent) were filled in the scramble for unmatched residents and positions. From 2001 through 2005, the University of Minnesota Department of Family Medicine residencies had between 285 and 370 applications per year, with 41 to 43 residents ultimately enrolling.

From 2001–2006, 76 percent of graduates from University of Minnesota family medicine residency programs chose initial practice sites in Minnesota; 58 percent of Duluth

⁴⁰ National Medical Student Match Data, 2003 – 2007.

⁴¹ Educating Minnesota's Future Health Professions Workforce: 2008 Update. Barbara Brandt and Kaia Sjogren, University of Minnesota Academic Health Center. January 2008

Graduate Medical Education Council graduates chose initial practice sites in Minnesota.⁴²

Taking a broader look at University of Minnesota primary care residencies, more than 75 percent of the graduates of internal medicine and medicine/pediatrics who intended to pursue primary care chose an initial practice site in Minnesota between 2003-2007.

New models of primary care

Traditional models of primary care delivery have limitations. They place the primary care physician in the role of a technical pieceworker, providing urgent acute care for illness. Reimbursement models pay for acute, episodic care provided face-to-face with a physician. Patients with complex chronic diseases find that short, problem-oriented interactions with primary care physicians do not meet their needs. The movement to measurement and transparency in health care data reporting on systems and physicians' performance on these measures has highlighted the limited success current models have to improve health of the community.

Other models of primary care have developed to address these issues. A number of different pilots utilizing these newer models have been implemented in health care delivery systems across Minnesota. These pilots recognize changing roles for health care practitioners as they coordinate their work into team efforts. The new models are largely based on two key concepts – the medical home, and the Wagner model for chronic care.

The American Academy of Pediatrics (AAP) introduced the concept of a “medical home” in 1967. It evolved to describe a partnership approach with families to provide primary care that was accessible, family-centered, coordinated, comprehensive, continuous, and culturally effective.⁴³ In 2002, recognizing fundamental flaws in the delivery of primary care in the United States, the leadership of seven national family medicine organizations conceived the Future of Family Medicine (FFM) project. The result was a proposal for a new model of practice for family medicine. The new model has defined 11 key characteristics: patient-centered care, whole person orientation, team approach, elimination of access barriers, information systems, redesigned offices, focus on quality and safety, enhanced practice finance, and a commitment to provide a portfolio of services. This model articulates a multidisciplinary team approach to care which requires a shift in the culture to cooperation and an understanding that the practice is more than the sum of its parts.⁴⁴

The Wagner Chronic Care Model (CCM) was an important contributor to the development of the concept of the medical home. Wagner's model was foundational in

⁴² Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

⁴³ *The Patient Centered Medical Home*. Robert Graham Center, November 2007.

⁴⁴ Martin, J.C., Avant, R.F., Bowman, M.A., et al, Future of Family Medicine Project Leadership Committee. (2004). The Future of Family Medicine: A collaborative project of the family medicine community. *Annals of Family Medicine*, 2, (suppl 1), S3-S32.

thinking about new models of care that could commit to being a medical home, including those that care for “medically fragile” patients with complex and chronic diseases.⁴⁵ CCM has six components: health care organization, community resource, self-management support, delivery system design, decision support, and clinical information systems.

These new models of care delivery redefine roles for all members of the health care team including pharmacists, nurses, dentists, and public health providers. As roles evolve in these new models, health care practitioners practice their discipline at the “top of their license.” For primary care physicians, this may require increased focus in their work on differential diagnosis and complex medical decision making. Other members of the team concomitantly change their focus, and teams of all these practitioners form alliances for care of individuals and the population. The Academic Health Center is actively engaged in piloting these models in training programs and measuring their effectiveness. Further, due to the significant involvement of the community in the education of health professionals, students have benefited from engagement in new models of care utilized in the community.

For example, in 2006, the University of Minnesota Medical School was one of 10 medical schools nationally selected for a two-year Chronic Illness Care Education grant from the Josiah Macy, Jr. Foundation. The Medical School partnered with Smiley’s Clinic, one of the University’s family medicine residency sites, to develop a curriculum in chronic illness care for medical students and family medicine residents. This is a longitudinal patient care and faculty mentoring experience focused on the care of chronically ill patients. Involvement in this grant allows both educational opportunities for students and residents and scholarship to understand the impact of these models of care delivery.

In another example, University of Minnesota Physicians and Fairview Health Services have worked collaboratively to develop an innovative health care system at Fairview Maple Grove Medical Center. This multi-specialty ambulatory care center is patient-focused and comprehensive. The clinic model integrates the best practices of primary care, chronic disease management, and specialty services.

University of Minnesota family medicine residency sites have incorporated pharmacists, social workers, and mental health professionals into the training clinic practices to offer educational opportunities in interdisciplinary ambulatory primary care.

Primary care practitioners play an important role in the delivery of mental health services. According to the Minnesota Rural Health Advisory Committee 2005 report, “Integration of mental health into primary care is a key to ensuring the best quality services.”⁴⁶ They recommended increased availability of a trained professional

⁴⁵ Wagner, E.H., Austin, B.T., Davis, C., et al. (2001). Improving chronic illness care: Translating evidence into action. *Health Affairs*, 20 (6), 64-78.

⁴⁶Mental Health and Primary Care. Minnesota Department of Health Office of Rural Health and Primary Care. January 2005.

workforce in primary and mental health care to meet the mental health needs of rural Minnesotans. Minnesota's Institute for Clinical Systems Improvement (ICSI) has undertaken the DIAMOND (Depression Improvement Across Minnesota, Offering a New Direction) project. It is a collaborative agreement on a chronic care delivery model and payment mechanism that supports best care for depression in primary care. This care management model mobilizes an interprofessional team including mental health and primary care clinicians utilizing an evidence-based guideline. The Medical School's family medicine residency clinics are pilot sites for this program.

Pharmacists' roles within health care are evolving, moving into the domain of collaborative direct patient care while maintaining responsibility for safety and proper distribution of medications. Medication therapy management service (MTMS) programs have developed, where a pharmacist conducts a comprehensive assessment of a patient to identify drug-related problems, develops a care plan to achieve patient-specific goals and therapy, and performs follow-up evaluation to resolve drug therapy problems. In Minnesota, pharmacists can enter into collaborative agreements with specific providers that permit an expanded role in modifying or initiating therapy based upon a protocol developed by the prescriber and the pharmacists. MTMS can help achieve improvement goals in chronic disease management when provided in collaboration with physicians and other health care professionals and in active collaboration with the patient. It fits well into the Wagner Chronic Care Model involving interrelationships among team members and interactions between the practice team and informed, activated patients.

The Minnesota Legislature authorized coverage of MTMS provided by pharmacists for medical assistance and general assistance medical care recipients in 2005. Coverage of MTMS is provided for medical assistance recipients taking four or more prescriptions to treat or prevent two or more chronic medical conditions, or when prior authorized by the commissioner for a recipient with a drug therapy problem that is identified. A recent study completed by University of Minnesota College of Pharmacy faculty concluded that the program was very effective in its first year; 36 percent of MTMS recipients with diabetes achieved optimal care compared to 6 percent statewide, using State of Minnesota QCare benchmark standards. The 10 most productive pharmacists in the first year of the MTMS program were those with established collaborative practice relationships with physicians and other primary care providers and were also part of an integrated health delivery system. This finding is consistent with health care delivery improvements advanced in the chronic care model and the medical home model concepts.⁴⁷

Nurses' roles within health care are evolving as well, and they are well-poised to assume broader roles in new interdisciplinary models of care delivery. They are holistically oriented and knowledgeable about health promotion and chronic disease management for children and adults in the context of the family. They are educated in establishing effective interpersonal relationships, fostering open communication, leading teams of people with varying backgrounds, and helping people learn self-care practices and treatment regimens. In the medical home model, nurses utilize these skills to partner with

⁴⁷ Isetts, B.J. Evaluating Effectiveness of the Minnesota Medication Therapy Management Care Program Final Report. December 14, 2007.

patients in understanding and assuming responsibility for their health management. Nurse practitioners are trained to assume more independent roles in providing health promotion and chronic disease management and coordination.

These new models of health care delivery require new models of education. This involves interprofessional team training and recognition of the expanding roles for non-physician providers. These professionals often work for those residing in medically underserved areas, improve access to primary care services, and are growing in number.

All of these change initiatives are leveraging the possibilities provided by technological transformations. Rapidly evolving information systems are supporting the transition of our health care system from a delivery system aimed at “providing episodic institutional care for the treatment of illness” to a system that supports community-based care, with greater consumer involvement in the prevention and management of illness across the lifespan.⁴⁸ Information technology is viewed as a powerful tool for achieving progress towards the six quality aims of the Institute of Medicine’s *Quality Chasm* report – safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity. Additionally, it operates as a means for meeting consumer demand for health information and health care services that are convenient, seamless, accessible, affordable, consumer-oriented, and that offer choice and some opportunity for control or input. Thus, information technology is playing an increasingly important role in supporting primary care, providing access to information for health professionals and the public, and it will be an important element of many new models of care.

AHC proposal for addressing primary care needs in Minnesota

Addressing the state’s primary care needs will require teamwork, partnerships, and a variety of strategies. The Academic Health Center is prepared to take a number of steps with support and participation from the state, health systems, communities, and practicing health professionals. These steps fall into four approaches:

- Strengthen the pipeline for primary care.
- Educational transformation.
- Expand and improve the use of information technology to support better health.
- Partnerships and scholarship.

No single strategy will serve as a silver bullet, and none of us can act alone. Given the complex variables that contribute to training the future workforce and the unclear picture of what future models of care will look like, we suggest a variety of steps aimed at traditional primary care workforce levers that are individually modest, but that over time should have real impact, and we suggest investing significant effort in developing and testing new models of care. It is also important to note that steps such as increasing the Medical School class size are longer-term solutions, given that it takes seven years before a larger cohort of students will enter practice. Given the pace of change in health care and

⁴⁸ Institute of Medicine. (2004). *Quality Through Collaboration: The Future of Rural Health Care*. Washington, D.C.: National Academy Press.

the market, we should be mindful of having a diversified set of short-term and long-term strategies.

Strengthen the pipeline for primary care

Maintain 10 percent increase in Medical School class size

The Medical School experienced an unanticipated increase in its entering class size this past year, increasing from 220 to 241. We propose to maintain that 10 percent increase in class size. This is a prudent increase, one that the Medical School can accommodate within existing facilities. Medical school enrollments nationwide are managed and monitored carefully by the accrediting organization, the Liaison Committee on Medical Education; it would be complex to expand the class beyond this amount and would require accreditation review and approval.

Increase by 10 the number of family medicine residency slots offered each year in Minnesota

76 percent of graduates of University of Minnesota family medicine residency programs establish their practice in Minnesota upon graduation. To expand the number of new physicians entering family medicine, we should provide expanded graduate medical education training opportunities in the state. With system-wide, partnership-based incentives for family medicine in place, we anticipate success at filling these incremental residency slots.

To add 10 incremental slots to University of Minnesota Family Medicine residency programs will require full funding from non-federal sources, acknowledging that the federal Centers for Medicare and Medicaid Service (CMS), which provides the majority of funding for residency slots across the nation, has capped the number of residency slots, and any new slots in Minnesota need to have full funding from alternate sources. In order to accommodate 10 new family residency slots, we will need to make capital improvements to three existing clinic sites, which are operating at capacity.

Importantly, these residency training sites will serve as pilots for new models of care delivery.

Increase economic incentives for primary care

The income gap between primary care and specialty care is widening; medical school tuition costs are growing, and student loan indebtedness has expanded dramatically across the country and in Minnesota. 2007 University of Minnesota Medical School graduates left with an average \$141,691 in educational debt. Research shows that students are increasingly concerned about managing their debt loads, which places primary care at a relative disadvantage as a career choice. To ameliorate this situation, we propose more robust loan repayment programs in Minnesota for primary care physicians in underserved communities. At a minimum, the state programs should be expanded to cover more primary care physicians who would like to pursue practice in underserved communities. Expansion of the state loan forgiveness program for primary care physicians in underserved communities will require additional funding support from the

legislature and a change in the statute to allow the additional funds to be targeted to these physicians.⁴⁹ Additionally, more robust and creative models of repayment could be considered, including a review of other states' programs for best practices.

Explore opportunities to engage foreign medical graduate immigrant talent

As referenced earlier, the demographics of Minnesota are changing with significant numbers of new immigrants entering the state. Large disparities in health care are seen among minority groups in Minnesota. The Medical School strives to increase diversity in the medical school class to serve the changing Minnesota population. However, another opportunity exists to bolster the diversity of the physician workforce. Internationally trained physicians (termed foreign medical graduates - FMGs) have immigrated to Minnesota along with their families in significant numbers and often seek to become licensed to practice medicine in Minnesota.

Licensure in Minnesota for FMGs involves completing at least two years of a U.S. residency and fellowship program that is accredited by the Accreditation Council for Graduate Medical Education. In order to be eligible for application to a residency program, a foreign medical graduate must receive an Education Commission for Foreign Medical Graduates (ECFMG) certificate. The purpose of ECFMG certification is to assess the readiness of FMGs to enter U.S. residency and fellowship programs. Licensing jurisdictions in the United States require that FMGs applying for unrestricted licensure be certified by ECFMG.

To obtain an ECFMG certificate, a FMG must have graduated from an approved medical school, successfully complete the U.S. Medical Licensing Examination (USMLE) Step 1 and Step 2 Medical Science examinations, the Clinical Skills examination, and the Test of English as a Foreign Language. Finally, in order to be competitive in residency placement, the FMG will need to complete a clinical observership experience under the supervision of a licensed physician who can write a recommendation for the foreign trained physician.

FMGs who enter a U.S. residency training program often face more hurdles. Cultural differences and communication issues complicate their interaction with patients. Successful completion of in-training assessment examinations required during residency medical training programs is challenging.

The Medical School recognizes the valuable primary care services that these FMG physicians could provide to Minnesotans after completing GME residencies and achieving licensure. The school could create programming to assist these graduates in successfully becoming ECFMG certified. This could include providing help to prepare for licensing examinations or providing a clearinghouse for appropriate resources. Further, the Medical School could provide resources to create cohort model groups to mentor, counsel, and support residents in training. In this way, cultural competency

⁴⁹ Options for Increasing the Supply of Primary Care Physicians in Rural Minnesota. Ira Moscovice and Michelle Casey, Rural Health Resource Center. January 2008.

issues could be explored and appropriate support for hurdles such as in-training assessment examinations could be provided.

Support retraining for previously licensed physicians

Another source of primary care physicians to address looming workforce issues are those who stepped away from practice for a few years and now want to be relicensed. Often, according to the Minnesota Board of Medical Practice, these are women who stopped practicing during child-rearing years and now wish to return. The Medical School is exploring options to create a retraining refresher course for these physicians. This could involve a beneficial partnership with community health systems who wish to hire these primary care physicians. Developing an appropriate program to provide the Board of Medical Practice with sufficient assurance that these physicians can practice competently could create more physician capacity. Such a program could also potentially provide the clinical observerships necessary for FMGs to successfully obtain a residency position.

Educational transformation

As the Medical School looks to the future and its responsibility in training primary care clinicians, it is clear that the educational models piloted must coordinate with primary care models developing in the broader Minnesota community. Medical education includes a mix of classroom-based instruction and experiential education in community-based clinical settings. Significant portions of each medical student's clinical training occur in community settings. Increasingly, such settings are often located within large integrated health systems in Minnesota. So the partnerships in educating our students involve the Medical School, the community preceptors, and the systems in which they practice.

The Medical School is engaged in articulating a comprehensive set of competencies to help inform measurement of outcomes for student learners. All students will learn about the needs, resources, and opportunities of rural and urban underserved people. Some students will choose a concentrated pathway to develop deeper competence in urban or rural health. These learning opportunities will be framed around a set of competencies that will allow for measurement of successful learning. The Medical School is engaging national, regional and local clinicians, scientists, and subject-related experts to evaluate these competencies before they are finalized to assure their relevance to future practice.

As the Medical School takes on the challenge of transforming its educational model to ensure learner centered education, a number of initiatives focus on primary care. *The Rural Physician Associate Program (RPAP)*, as previously discussed, has been a very successful program in educating third-year medical students in rural settings, partnering with communities in this endeavor. Traditionally designed for students with demonstrated interest in rural primary care and experience in rural life, the program has expanded in recent years due to increased student interest. As the face of rural Minnesota changes with increased diversity and new immigrant populations, students with interest in serving those populations in the future are also drawn to apply to this program. Students spend nine months in a rural community, requiring a substantial time commitment by the

community physicians involved in their education. The demand for this program continues to increase, and new sites for students will be necessary.

The critical experience in the RPAP program is longitudinal care of a population of patients. The Medical School is considering a potential program that would replicate this model in an urban setting with an underserved population. Again, this could involve a significant engagement of community preceptor clinicians in the education of students over a sustained period.

Other Medical School programs in the planning phase include ambulatory care experiences, chronic illness care, and integrative medicine where students are assigned to a given patient population over time to participate in each of these types of medical care longitudinally. All of these programs allow students to gain knowledge that is fundamental to primary care, engaging in relationship-based care delivery that allows understanding of the patient in their totality.

A Rural Health Scholars Program has been explored as another possible track for students to educate and train physicians with the specific skills and expertise needed for rural and American Indian health care. It would be a rural-specific medical school curriculum in which the basic science and clinical education would be taught in the context of rural populations and communities. Medical students would receive clinical experience and teaching throughout their years of medical school. This program would involve partnerships between the Medical School and rural and regional communities.

Another possible pilot program being explored involves “fast-tracking” carefully selected students through medical school and into primary care residencies in three instead of four years.

To successfully maintain and expand the Medical School’s focus on primary care, additional resources will be necessary. Involving community physicians as faculty in these intense longitudinal programs will require significant commitment. As the Medical School develops and implements competency-based educational models, community faculty responsible for teaching in these intensive programs will be asked to engage in outcomes evaluations and piloting of new educational models. This will necessitate a deepening of the mutual commitment between the community and the Medical School. To assure this commitment, it will be necessary to consider compensating community physicians involved in programs such as the *Rural Physician Associate Program (RPAP)*.

Providing sustained funding for community preceptors, faculty, and programmatic administration of the RPAP program would allow for the necessary expansion of RPAP sites to meet student demand. It would allow for assurance of high quality learner-centered education by creating the opportunity for more engagement in the educational process than is available with volunteer faculty. As the Medical School develops a set of learning competencies for rural medicine, measures student outcomes, and holds students and preceptors accountable for their accomplishment, remuneration of the community physicians involved is important.

The same issues arise with development of a comparable urban longitudinal learning program for third-year medical students. Again, resources to compensate community preceptors involved in these nine-month experiences would create more faculty engagement and accountability and more stability in arranging for sites for students. The potential costs would be slightly lower, as an urban experience would not require the significant amount of travel undertaken by RPAP University faculty to teach at the rural sites.

Interprofessional models of primary care delivery

There are a number of powerful external forces driving the need for educational transformation. The AHC and the Medical School are committed to addressing the calls for new models of health care delivery and education. To address the national push for restructuring of health professions education toward interprofessional practice, in 2007 the University of Minnesota Academic Health Center established the Center for Interprofessional Education. The Center provides the AHC with the structure and facilitation necessary to support interprofessional education across the health professional schools. Students trained in interprofessional teams will be better prepared to function with other disciplines in a complex health care system that demands better integration of prevention, wellness and health promotion, and improved quality and safety, efficient delivery, and reduced cost.

Expand and improve the use of information technology to support better health

The adoption of information technology to support health care is well underway in Minnesota, with notable guidance provided by the Minnesota e-Health Initiative. The pace of this change will only be sustained, if not faster, as all of Minnesota's health care providers prepare to have interoperable electronic health records (EHRs) by 2015. We will continue to support and advance that work through our participation in the e-Health Initiative, and we will leverage the use of information technologies such as telemedicine and access to the Internet to improve health care quality and access in underserved areas.

Consistent with this commitment, the Academic Health Center is making significant academic investments in the field of health informatics. We have formed the Institute for Health Informatics, a new interdisciplinary home for health informatics research and development, and are in the process of hiring more faculty across the health sciences to fuel and advance that work.

The University of Minnesota Health Sciences Libraries support the Academic Health Center's goal to expedite the dissemination and application of new knowledge into the promotion of health and delivery of health care in Minnesota in myriad ways. Launched in 2007, "My Health Minnesota → Go Local" is a service of the Health Sciences Libraries in partnership with the National Library of Medicine, the Mayo Clinic Libraries, and the MINITEX Library Information Network. My Health Minnesota → Go Local is a free, online directory of health care services and providers throughout Minnesota, including clinics, hospitals, nursing homes, assisted living facilities, health

screening programs, and more. It aims to improve access to trusted health information for patients. All 87 counties in Minnesota are covered. The project complements MedlinePlus, a Web site from the National Library of Medicine that provides trusted health information. This resource is being promoted through a strong partnership with the public libraries in Minnesota.

To meet the information needs of health professionals across the state, the Health Sciences Libraries are exploring the feasibility of providing online access to a core set of clinical knowledge resources (evidence-based practice guidelines, journal articles, and other decision support tools) to all Minnesota health professionals. A project is underway to identify target resources through discussions with stakeholders (librarians, health systems, state agencies, health professionals, professional associations, and others), investigate the cost, and determine an effective way to provide access via the Internet. A model of shared funding by stakeholders and the state is envisioned. A report and recommendations will be available in August 2008.

Partnerships and scholarship

There are no simple solutions to the challenge of improving primary care across Minnesota, and very few involve just a single organization. For example, for the University to open the spigot and train more future doctors in the same way clearly will not solve Minnesota's primary care problems. Developing and implementing those creative and effective solutions that will meet Minnesota's primary care needs lie in partnerships among the state's educational institutions, the community of health professionals, policy makers, payors/insurers, and local communities, and in "connecting the dots" of existing programs, investments, and systems in new ways.

Integration of health systems in Minnesota has offered interesting opportunities that influence the direction of health care delivery today. Leveraging this integration, statewide organizations focused on quality, patient safety, and transparent public health care data reporting have developed including the Institute for Clinical Systems Improvement, Stratis Health, Minnesota Alliance for Patient Safety, and Minnesota Community Measurement. Moreover, integration of health systems also offers the opportunity to explore new collaborative and inter-professional models for integrating population health concepts and strategies for prevention and health promotion focusing on individuals, groups, and whole communities.

Develop and test new models of care

The University is poised to partner with the health care systems and communities to advance conversations and planning about the future of primary care for Minnesota. The University will convene statewide discussions beginning in spring 2008 to develop a long-range plan for new models of health care delivery in Minnesota and to develop plans for piloting and testing those new models. These discussions will include models that are currently being tested in Minnesota, a vision for systems where all practitioners operate at the "top of the license." These discussions will lead to the development of an integrated plan for identifying and seeding the next generation of pilots and tests.

Recognizing that communities and systems across the state often have different issues, different challenges, and varying access to human resources and health professionals, this planning effort will rely upon the principles provided by the Institute of Medicine through its seminal works, including *Crossing The Quality Chasm: A New Health System for the 21st Century* (2001) and *Quality Through Collaboration: The Future of Rural Health Care* (2004) to guide our work. The IOM aims of safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity will underpin our work. In addition, we will be mindful of the guiding principles for reforming rural health care articulated in the 2004 report:

- All rural Americans should have access to the full spectrum of high-quality, appropriate health care, regardless of where they live.
- Rural communities should focus greater attention on improving population health in addition to meeting personal health care needs.
- A core set of health care services (primary care, dental care, basic mental health care, and emergency medical services) should be available within rural communities.
- When care cannot be delivered locally, links should be established to services in other locales.
- The spectrum of services available in rural communities should be based on the population health needs of the local community.
- The provision of rural health care services should be shaped and guided by local community and rural organizations and institutions.
- Rural health care requires a team of well-trained health care clinicians, managers, and leaders working together.

In addition to convening and coordinating these conversations, the University will provide the research expertise necessary to underpin the planning effort and to develop and test new models of care. We will engage the faculty across the University, including those in the Medical School's new Center of Excellence in Primary Care, which was created to promote research, including practice-based research, and enhance the primary care medical home, to build the body of scholarship and evidence on the new models. We anticipate this body of evidence will start to build over the next two to three years, and it will ultimately provide decision makers and the public with the information needed to make prudent and forward-looking decisions about investments that will improve the overall quality and cost of health care in Minnesota.

Advocate for better reimbursement for primary care physicians

Inadequate reimbursement for primary care continues to thwart innovation in primary care, depresses interest in the field, and exacerbates primary care physician shortages. The current reimbursement structure impedes our collective ability to make dramatic improvements in health and health care; it has systemic impact. We will join with others who are advocating for change in the primary care reimbursement system.

Partner with communities

Meeting the state's primary care needs, especially the needs of those communities that are currently underserved, will require a new level of partnership between the University and those communities, and with health systems when appropriate. We will need to work together in new and more creative ways to recruit and retain primary care physicians and other health professionals key to providing primary care.

To enhance and support joint work to recruit and retain health professionals, as well as to enhance awareness of health professions careers within the K-12 population, coordinate primary care education, and work with communities to develop and test new models of care delivery, we will strengthen the AHEC platform.

We will work with partners such as the Minnesota Health Literacy Partnership to empower Minnesotans to participate more fully in their own health.

We will also explore partnerships with those foundations in Minnesota that have invested heavily in improving the quality of health for Minnesotans, acknowledging the powerful levers they have developed to identify and seed new projects, their track record in developing the next generation of leaders, and their ability to forge connections with communities across the state.

Conclusion

Minnesota's primary care systems require attention. Too many Minnesotans do not have ready access to primary care, especially those who live in underserved rural and urban communities. Training more doctors in the old model is not a viable solution – we will need to strengthen our pipeline of primary care physicians, develop robust educational opportunities in rural and underserved health care, explore new models of care, and engage in substantive dialogue with all stakeholders to develop viable systems for health care delivery for all Minnesotans.

Summary Financial Table: Enhance Primary Care in Minnesota

	Baseline	Year 1	Year 2	Year 3	Year 4
<i>Increase Medical School Class Size by 10 percent</i>					
Incremental expenses	--	\$ 1.57M	\$ 3.26M	\$ 5.09M	\$ 7.06M
Size of entering class	220	242	242	242	242
Incremental enrollment	--	22	22	22	22
Total MD program enrollment	880	902	924	946	968
<i>Increase Family Medicine residency slots offered by 10 per year</i>					
Incremental expenses	--	\$ 1.50M	\$ 3.12M	\$ 4.87M	\$ 5.06M
Family Medicine residency slots offered	83	93	93	93	93
Incremental residents placed	--	10	10	10	--
Total Family Medicine residents	249	259	269	279	279
<i>Make capital improvements to U of M Family Medicine clinics to accommodate 30 additional residents</i>					
Incremental expenses (one-time cost)	--	\$ 7.50M	--	--	--
<i>Expand the RPAP program to accommodate 60 students/year and compensate community preceptors</i>					
Total RPAP program expenses	\$ 1.83M	\$ 2.20M	\$ 2.29M	\$ 2.38M	\$ 2.47M
Existing state funding allocation for RPAP	\$ 0.74M	\$ 0.74M	\$ 0.74M	\$ 0.74M	\$ 0.74M
Net O&M expenses for RPAP program	\$ 1.09M	\$ 1.46M	\$ 1.55M	\$ 1.64M	\$ 1.73M
RPAP program student participants	50	60	60	60	60
<i>Create an urban analogue to RPAP program</i>					
Urban RPAP program expenses	--	\$ 0.52M	\$ 0.66M	\$ 0.81M	\$ 0.97M
Urban RPAP program student participants	--	10	15	20	25
Total Expenses	--	\$ 12.55M	\$ 8.59M	\$ 12.41M	\$ 14.82M

Inflation: All cost projections include 4 percent annual inflation

Class size increase:

- Based on 2005 cost per degree estimate of \$348, 276, or \$71,304 per student.
- 30 percent discount rate for fixed costs.
- Permanent increase in incoming class of 22 students attending for four years produces an eventual increase of 88 students over current total enrollment.
- Total MD enrollment estimate assumes no new arrivals or departures during program.

Family medicine residency slots:

- Based on five-year average of 83 family medicine residency slots per year, with each residency lasting three years.
- Permanent increase of 10 three-year residency slots produces an eventual increase of 30 residents over current slots.
- Expenses estimated at \$150,000 per slot.
- Approximately 55 percent of residency slots are in U of M residency programs.

Clinic improvements:

- Three clinics at \$2.5 million per clinic to accommodate 10 incremental residency slots per clinic.

RPAP:

- Sixty students at \$14,000 per student per year stipend.
- \$5,000 payment per preceptor.
- Airfare, mileage, educational resources, operating supplies, and program administration costs included in total budget.

Urban RPAP:

- Estimated expenses of \$22,000 per student for stipend, preceptor payments, computer equipment, and travel.
- Estimated administrative and program support expenses of \$297,000.