



STEVENS POINT AREA 2007 ECONOMIC INDICATORS

**3rd Quarter 2007
presented
November 9, 2007**

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**Special Report: The Physician Workforce Shortage and the Implications for
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Presentations and research activities of the Central Wisconsin Economic Research Bureau in Stevens Point are made possible by a generous grant from M&I Marshall & Ilsley Bank of Stevens Point. We wish to thank them for their continuing support.

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National and Regional Outlook

The data in Table 1 shows that real GDP expanded from \$11.3 trillion to \$11.6 trillion over the past twelve months or by 2.6 percent. The output of the nation's factories increased by approximately 2.0 percent in the third quarter 2006 to the third quarter 2007 comparison. Meanwhile short-term interest rates declined from 4.77 percent to 3.82 percent over the same period. Moreover, inflation as measured by the Consumer Price Index rose by 2.8 percent. The inflation rate while moderate is in the upper range of what the Federal Reserve feels is acceptable.

The year over comparison figures in Table 1 indicate that the economy has performed reasonably well over the past twelve months. Along the same line the most recent data suggests that the nation's Gross Domestic Product rose by an unexpectedly healthy 3.9 percent during the July-September 2007 time frame. Further, 166,000 jobs were created in the nation during October 2007.

However, as I mentioned in a previous report the sub prime housing market was a wild card in terms of any forecast about economic performance. It appears the collapse of the sub prime housing market is now putting a considerable amount of downward pressure on the economy.

The Federal Reserve has become so concerned by the situation that it has already cut the key federal funds rate twice. The cuts have lowered this key short-term borrowing rate by 75 basis points. Thus, the central bank of the United States has temporarily switched its focus from fighting inflation to trying to prevent the economy from slipping into a recession. In other words, the Federal Reserve is now attempting to provide a sufficient amount of liquidity to offset the negative economic effects of the sub prime housing market collapse.

The Federal Reserve and a number of prominent economists are concerned that the sub prime housing market woes might spread to the broader economy. How this might happen is very complex. In brief, the impact of this financial situation cuts across many segments of the economy. The impact on home owners is not just limited to those who are experiencing foreclosure. In California, Florida, Texas, the northeastern corridor and large urban areas, home prices are falling. This means there is less of an opportunity to extract wealth from real estate. To a large extent the consumption surge that fueled the economy during the post dot-com era bubble and the post 9/11 attack was predicated on consumer spending financed by real estate appreciation. Household consumption of goods and services accounts for approximately two-thirds of all economic activity, so anything that impacts consumption will have a large influence on economic performance.

The problem, however, goes beyond the home owner. Major financial institutions like Merrill Lynch, Bear Sterns, Countrywide Financial, and Citi Bank are facing serious financial difficulty because of the sub prime housing market collapse. In brief the investment in nonperforming real estate backed financial instruments have had a large

negative effect on the balance sheets of these and other financial institutions. In and of itself this is bad for the economy, but it goes further than this. A more serious problem is that this could make getting credit more difficult for corporations. In other words an impairment of our nation's credit market would hamper corporate spending and have a large impact on profits, income and job creation. This of course would not bode well for the stock market which has been another major source of wealth creation in the United States. To the extent that people feel less wealthy, whether it be from falling housing prices or a decline in their stock portfolio, it will have a negative influence on household spending.

Lastly no one knows, not even the Federal Reserve, the extent of the fallout from the sub prime housing collapse. Case in point, some analysts forecast the loss to financial institutions to be in the \$400 billion range while others say the loss may amount to only \$40 billion. Clearly there is a great deal of uncertainty surrounding the situation. However, the Federal Reserve and economists in general are in agreement that the probability of a recession next year has risen. Some like Alan Greenspan put the probability in the 35-40 percent range. Only time will tell how this situation plays out. The best guess is that it will be about mid-2008 before this question can be answered.

TABLE 1**NATIONAL ECONOMIC STATISTICS**

	2006 Third Quarter	2007 Third Quarter	Percent Change
Nominal Gross Domestic Product (Billions)	\$13,266.9	\$13,926.7	+5.0
Real Gross Domestic Product (Billions of 2000 \$)	\$11,336.7	\$11,630.7	+2.6
Industrial Production (2002 = 100)	112.2	114.4	+2.0
Three Month U.S. Treasury Bill Rate	4.77%	3.82%	-19.9
Consumer Price Index (1982-84 = 100)	202.9	208.5	+2.8

Central Wisconsin

The third quarter economic results for central Wisconsin are summarized in the following. The unemployment rates, while at historically low levels, rose uniformly in the three county region. Overall nonfarm employment growth was strong. This is particularly true for Portage County. Industrial sector employment growth was equally strong. The main area of weakness, however, was manufacturing which lost 1,300 positions. Sales tax figures for the region were positive. Lastly, regional business leaders indicated little change in local economic and industry conditions.

Unemployment rates were higher for all of the reporting areas in Table 2. It should be pointed out, however, that the rates are still very low from a historical standpoint. The unemployment rate was 4.0 percent for Marathon, 3.7 percent for Portage, and 4.9 percent for Wood counties. The labor force weighted unemployment rate was 4.2 percent for central Wisconsin. The overall unemployment rate for the state was 4.6 percent. This nearly matches the 4.5 percent unemployment rate for the nation.

Table 3 gives the estimates of total employment that are based on a survey of households. Marathon County payrolls expanded by 0.4 percent during the year, Portage County payrolls grew by an even faster 2.3 percent. Wood County, however, is estimated to have declined by 2.8 percent over the past twelve months. Because of this central Wisconsin posted a small 0.1 percent increase gain in total employment. However, this result bested the state's performance of a negative 0.7 percent change in payrolls. During the same period the U.S. grew by a more robust 1.0 percent.

Table 4 presents estimates of nonfarm employment that are created from employer based data. Overall, a 2.5 percent gain, or a 3,700 job increase, was registered for the three county area. Manufacturing continues to put a considerable amount of downward pressure on the employment figures, declining by 1,300 positions from last year. Greatly helping the employment situation was the growth in the education & health services sector. This sector added about 1,700 jobs to the three county economy offsetting the decline in manufacturing.

Table 5 gives county sales tax distribution figures. This is a measure of trade activity in an area and trade activity tends to be a good benchmark in terms of how the overall economy is performing. In Portage County the figure rose by about 1.0 percent from last year's mark. Marathon County grew by nearly 6 percent and Wood County expanded by 22.6 percent. Thus, the three county region registered a solid amount of growth in its trade activity.

Each quarter the CWERB surveys a group of regional business people to ascertain their views on the economy. When asked about recent changes in national economic conditions they indicated that economic matters have deteriorated. However, they feel that the local economic conditions are unchanged from the June 2007 time frame. When we asked them to forecast the change in national economic conditions

they responded by saying that conditions would be relatively unchanged over the next three months. They also responded in a similar way about local economic conditions and the prospects for their particular industry. In other words they foresaw little change taking place.

TABLE 2**UNEMPLOYMENT IN CENTRAL WISCONSIN**

	Unemployment Rate September 2006	Unemployment Rate September 2007	Percent Change
Portage County	3.5%	3.7%	+5.6
City of Stevens Point	4.2%	4.8%	+14.3
Marathon County	3.6%	4.0%	+9.5
Wood County	4.2%	4.9%	+18.3
Central Wisconsin	3.7%	4.2%	+13.5
Wisconsin	4.1%	4.6%	+12.3
United States	4.4%	4.5%	+3.7

TABLE 3**EMPLOYMENT IN CENTRAL WISCONSIN**

	Total Employment September 2006 (Thousands)	Total Employment September 2007 (Thousands)	Percent Change
Portage County	39.8	40.7	+2.3
City of Stevens Point	14.0	14.1	+0.7
Marathon County	72.1	72.4	+0.4
Wood County	39.1	38.0	-2.8
Central Wisconsin	150.9	151.1	+0.1
Wisconsin	2,962.2	2,941.9	-0.7
United States	145,010	146,448	+1.0

* Percent change figures reflect data before rounding

TABLE 4**CENTRAL WISCONSIN EMPLOYMENT CHANGE BY SECTOR**

	Employment September 2006 (Thousands)	Employment September 2007 (Thousands)	Percent Change
Total Nonfarm	151.6	155.3	+2.5
Total Private	131.4	136.3	+3.7
Construction & Natural Resources	5.9	6.8	+14.5
Manufacturing	30.0	28.7	-4.2
Trade	25.0	25.6	+2.3
Transportation & Utilities	8.1	8.3	+2.8
Financial Activities	10.5	11.8	+12.1
Education & Health Services	21.7	23.4	+7.8
Leisure & Hospitality	12.2	13.0	+6.4
Information & Business Services	17.8	18.8	+5.5
Total Government	20.2	19.0	-5.9

TABLE 5**COUNTY SALES TAX DISTRIBUTION**

	Sales Tax 2006 Third Quarter (Thousands)	Sales Tax 2007 Third Quarter (Thousands)	Percent Change
Portage County	\$1,272.9	\$1,283.8	+0.9
Marathon County	\$2,644.8	\$2,799.7	+5.9
Wood County	\$1,169.7	\$1,433.7	+22.6

* Percent change figures reflect data before rounding

TABLE 6

BUSINESS CONFIDENCE IN CENTRAL WISCONSIN

	Index Value	
	June 2007	September 2007
Recent Change in National Economic Conditions	48	42
Recent Change in Local Economic Conditions	46	50
Expected Change in National Economic Conditions	44	49
Expected Change in Local Economic Conditions	49	50
Expected Change in Industry Conditions	52	51

100 = Substantially Better

50 = Same

0 = Substantially Worse

FIGURE 1

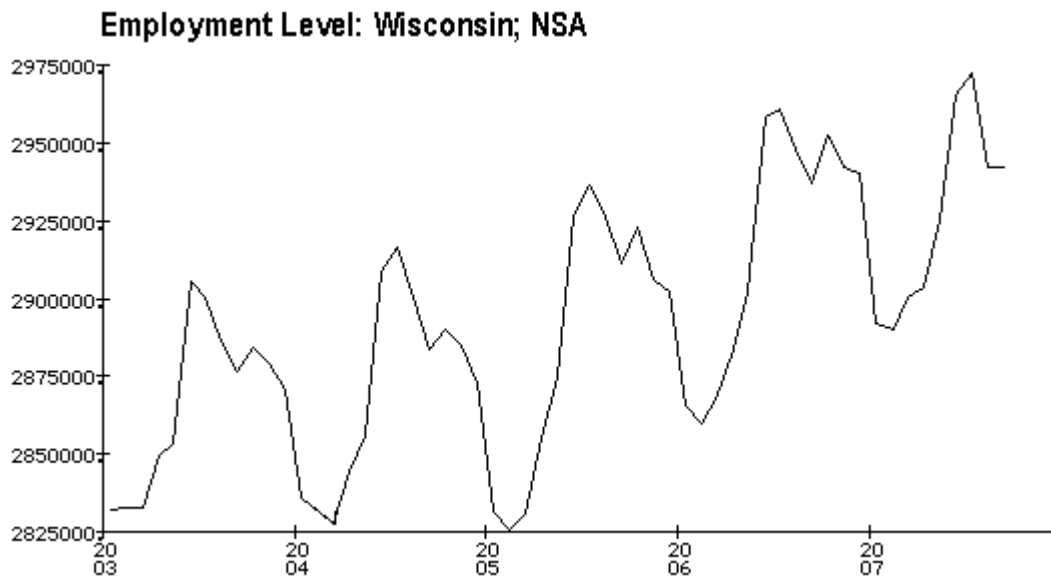


FIGURE 2

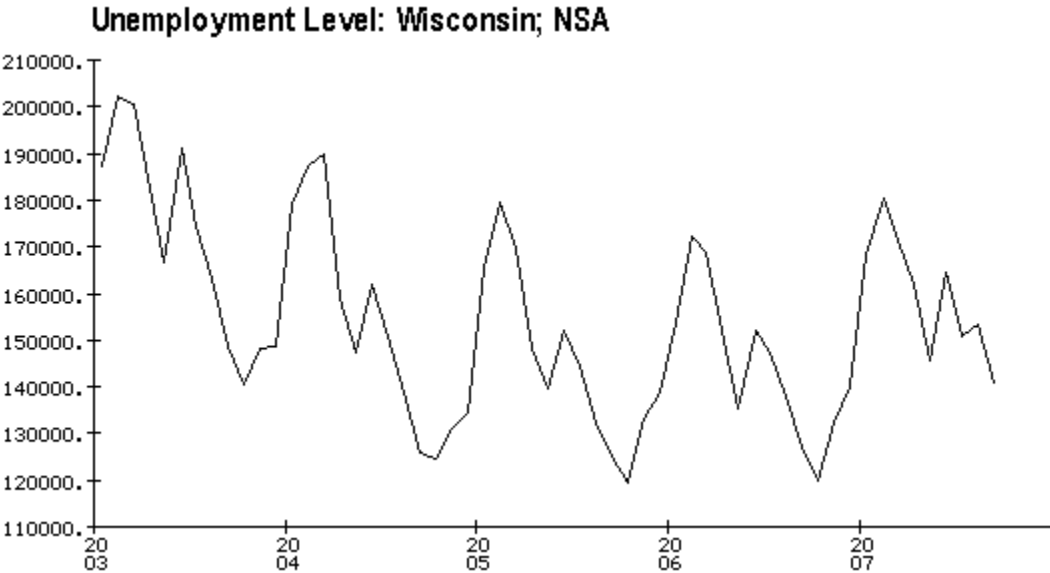


FIGURE 3

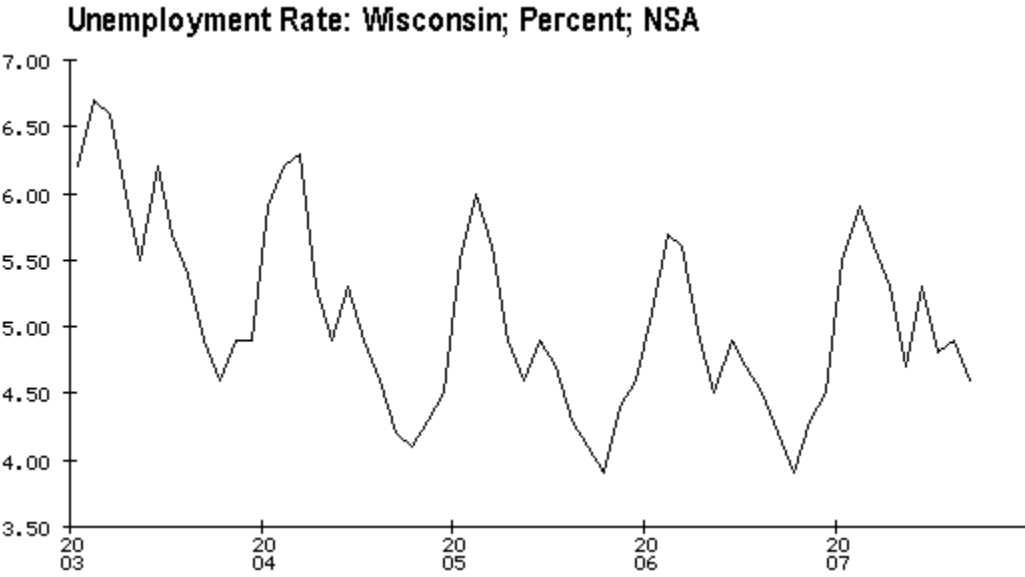


FIGURE 4

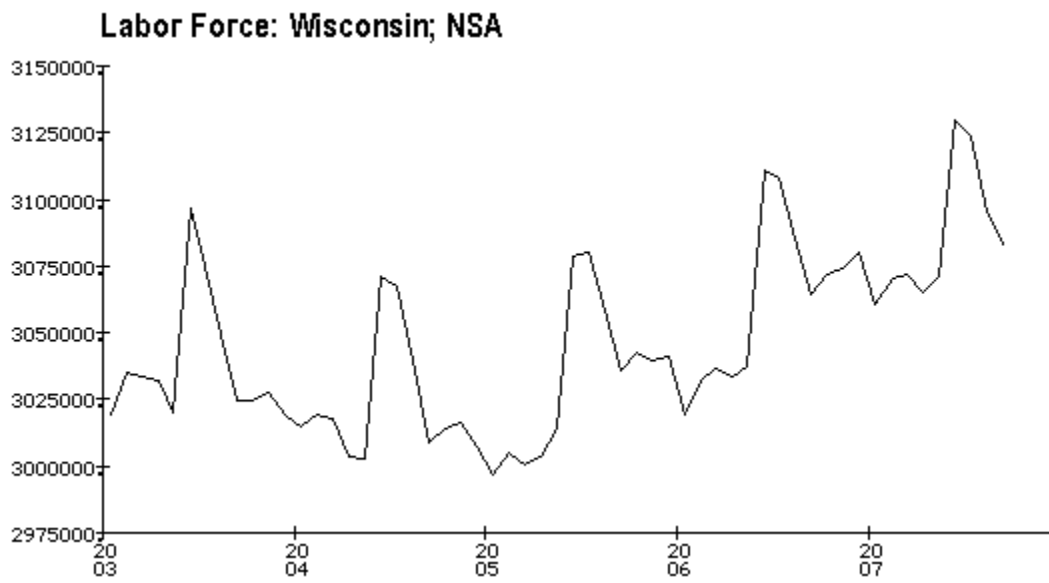


FIGURE 5

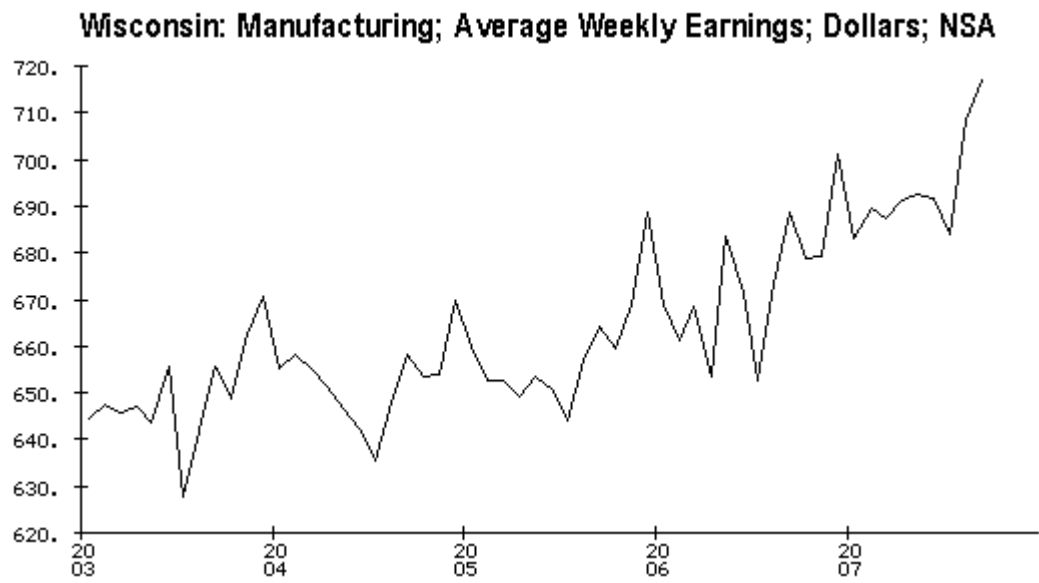


FIGURE 6



The Greater Stevens Point-Plover Area

The economic indicators for third quarter 2007 are as follows. Nonfarm total unemployment is estimated to have expanded by 5.5 percent over the past twelve months. Local retailers indicated that store traffic and sales are stronger than a year ago. Help wanted advertising remains stable in the area. The data suggest that public assistance claims have increased and unemployment claims have declined. Lastly residential and nonresidential construction activity is well off the pace of third quarter 2006.

Total nonfarm employment comes from a state of Wisconsin survey of business firms. Total nonfarm employment is estimated to have grown by a very healthy amount. Nonfarm employment payrolls expanded from 35.4 thousand to 37.3 thousand or by 5.5 percent over the course of the year. Except for manufacturing and transportation & utilities, all the other sectors in the local economy expanded. Financial activities and leisure & hospitality added the most positions over the past twelve months; 600 and 1,000 jobs respectively.

The retailer survey presented in Table 8 shows that local merchants are generally more optimistic than what they were in June 2007. When surveyed in September the groups said that store sales and traffic were better than a year ago. More importantly they believe that future store traffic and sales will be higher during the coming holiday period. As alluded to earlier their overall assessment of the local retail scene indicates an improvement taking place in retail conditions.

Help wanted advertising is an indicator of the health of the local labor market. Even though it does not capture all of the positions available in the community it is nonetheless highly correlated to the direction of the labor market. The help wanted index for Stevens Point remains virtually unchanged from last period. This suggests that labor market conditions in the next quarter should remain fairly stable.

Table 10 and 11 present information on the level of family financial distress in Portage County. The number of new public assistance claims on a monthly average basis rose from 254 to 270; representing an increase of 6.3 percent. However, the total public assistant caseload barely rose from third quarter 2006. The total caseload figure went from 5,424 to 5,488, rising by 1.2 percent over the past twelve months. During that same time period unemployment claims on a weekly average basis dropped from 151 to 120 for a decline of 20.4 percent. Likewise the number of total claims contracted from 949 to 789 or by 16.9 percent.

Residential construction activity numbers are given in Table 12. In general the data indicate a fall off in this type of activity. Residential permits issued fell from 37 to 25 or 32.4 percent in the year over comparison. The value of the home building activity declined from \$8.3 million to \$5.2 million, a decline of almost 37 percent. The number of units actually rose from 48 to 51 over the year. Residential alteration activity fell from

246 permits to 219 permits, or by 11 percent; and the associated value for alteration activity declined by about 10.5 percent.

Table 13 shows there were similar declines in nonresidential construction activity. The number of new permits issued went from 17 to 5 and the estimated value of this activity contracted from \$6.5 million to \$1.1 million. Similarly that number of business alteration permits fell from \$8.0 million to \$2.8 million over the same period. Thus, Tables 12 and 13 shows that a marked decline has taken place in local building activity.

TABLE 7

PORTAGE COUNTY EMPLOYMENT CHANGE BY SECTOR

	Employment September 2006 (Thousands)	Employment September 2007 (Thousands)	Percent Change
Total Nonfarm	35.4	37.3	+5.5
Total Private	29.5	31.3	+6.0
Construction & Natural Resources	1.2	1.3	+6.0
Manufacturing	5.4	4.7	-13.0
Trade	5.7	6.2	+8.5
Transportation & Utilities	1.9	1.7	-12.2
Financial Activities	4.1	4.7	+15.4
Education & Health Services	3.3	3.5	+6.6
Leisure & Hospitality	3.3	4.3	+29.5
Information & Business Services	4.6	4.9	+6.9
Total Government	5.9	6.1	+3.2

* Percent change figures reflect data before rounding

TABLE 8

RETAILER CONFIDENCE IN STEVENS POINT-PLOVER AREA

	Index Value	
	June 2007	September 2007
Total Sales Compared to Previous Year	54	58
Store Traffic Compared to Previous Year	50	60
Expected Sales Three Months From Now	54	60
Expected Store Traffic Three Months From Now	50	58

100 = Substantially Better
50 = Same
0 = Substantially Worse

TABLE 9

HELP WANTED ADVERTISING IN PORTAGE COUNTY

	Index Value	
	2006	2007
Stevens Point (September) 1980=100	70	69
U.S. (August) 1987=100	31	23

TABLE 10

PUBLIC ASSISTANCE CLAIMS IN PORTAGE COUNTY

	2006 Third Quarter (Monthly Avg.)	2007 Third Quarter (Monthly Avg.)	Percent Change
New Applications	254	270	+6.3
Total Caseload	5,424	5,488	+1.2

TABLE 11

UNEMPLOYMENT CLAIMS IN PORTAGE COUNTY

	2006 Third Quarter (Weekly Avg.)	2007 Third Quarter (Weekly Avg.)	Percent Change
New Claims	151	120	-20.4
Total Claims	949	789	-16.9

TABLE 12**RESIDENTIAL CONSTRUCTION IN STEVENS POINT-PLOVER AREA***

	2006 Third Quarter	2007 Third Quarter	Percent Change
Residential Permits Issued	37	25	-32.4
Estimated Value of New Homes	\$8,292.3 (thousands)	\$5,234.1 (thousands)	-36.9
Number of Housing Units	48	51	+6.3
Residential Alteration Permits Issued	246	219	-11.0
Estimated Value of Alterations	\$2,420.1 (thousands)	\$2,164.8 (thousands)	-10.5

TABLE 13**NONRESIDENTIAL CONSTRUCTION IN STEVENS POINT-PLOVER AREA***

	2006 Third Quarter	2007 Third Quarter
Number of Permits Issued	17	5
Estimated Value of New Structures	\$6,495.3 (thousands)	\$1,045.2 (thousands)
Number of Business Alteration Permits	43	40
Estimated Value of Business Alterations	\$7,958.6 (thousands)	\$2,794.5 (thousands)

* Includes Stevens Point, Village of Plover, and the Towns of Hull, Stockton, Sharon, and Plover.

FIGURE 7

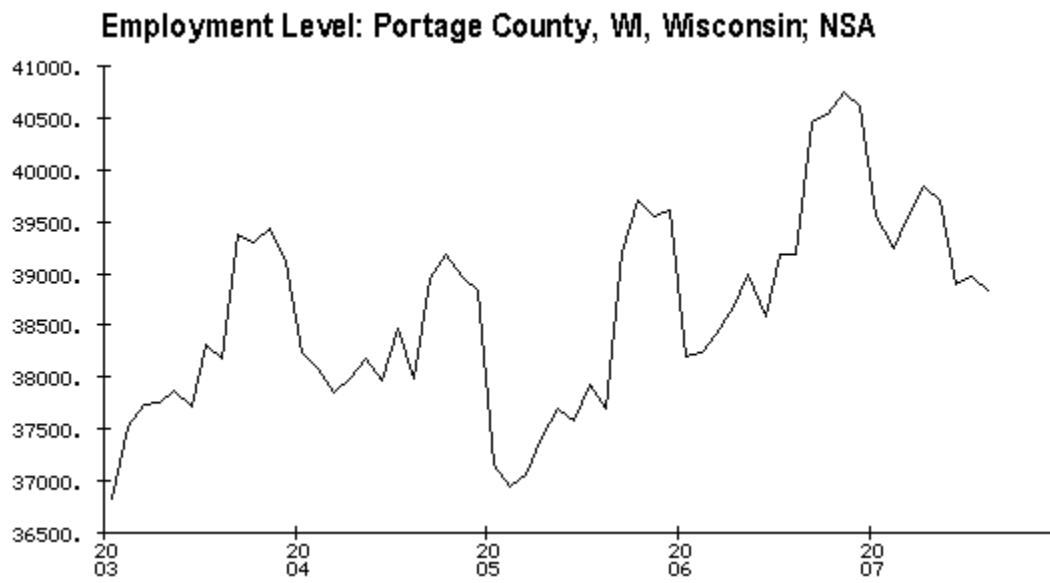


FIGURE 8

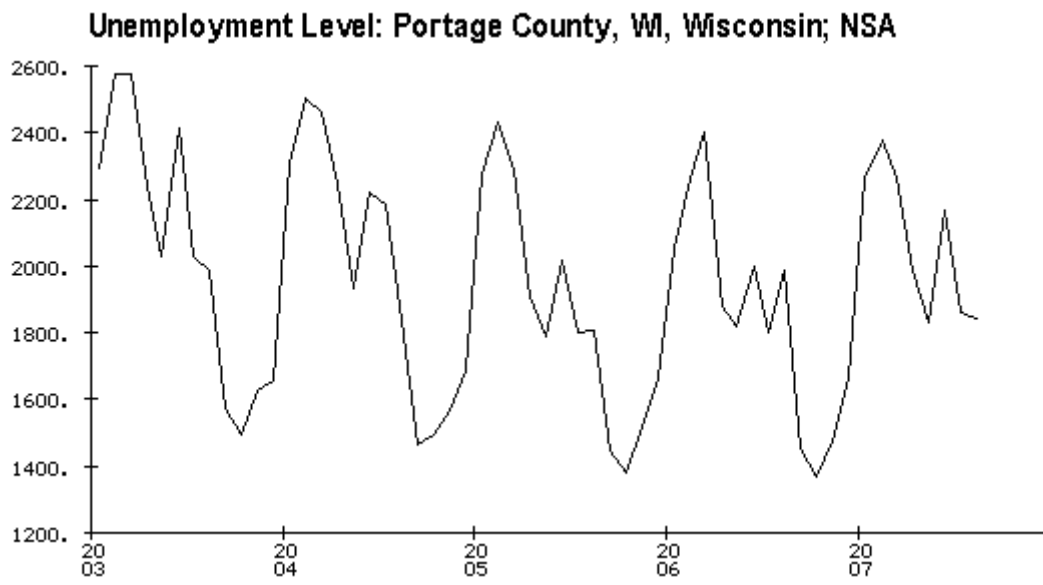


FIGURE 9

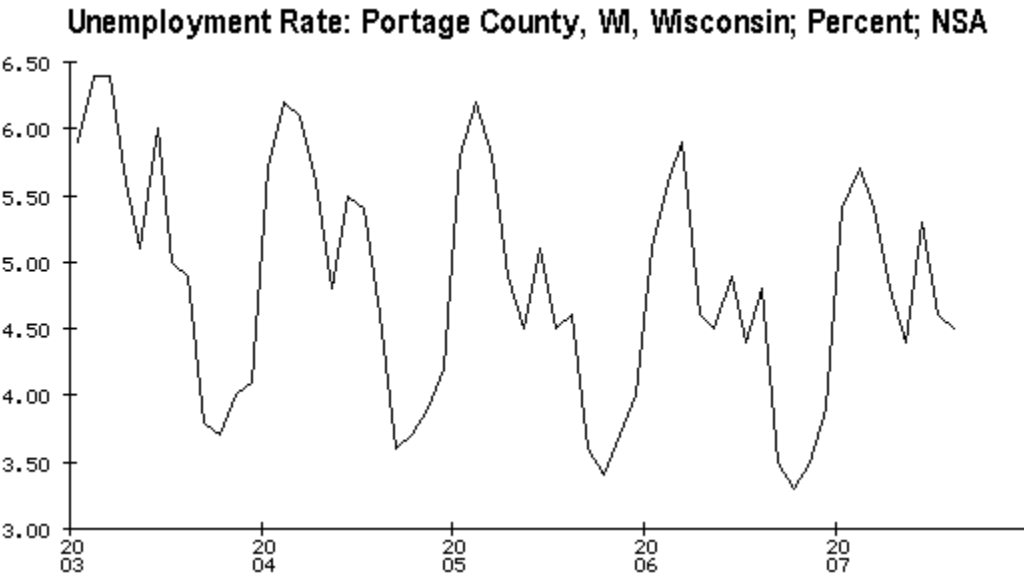
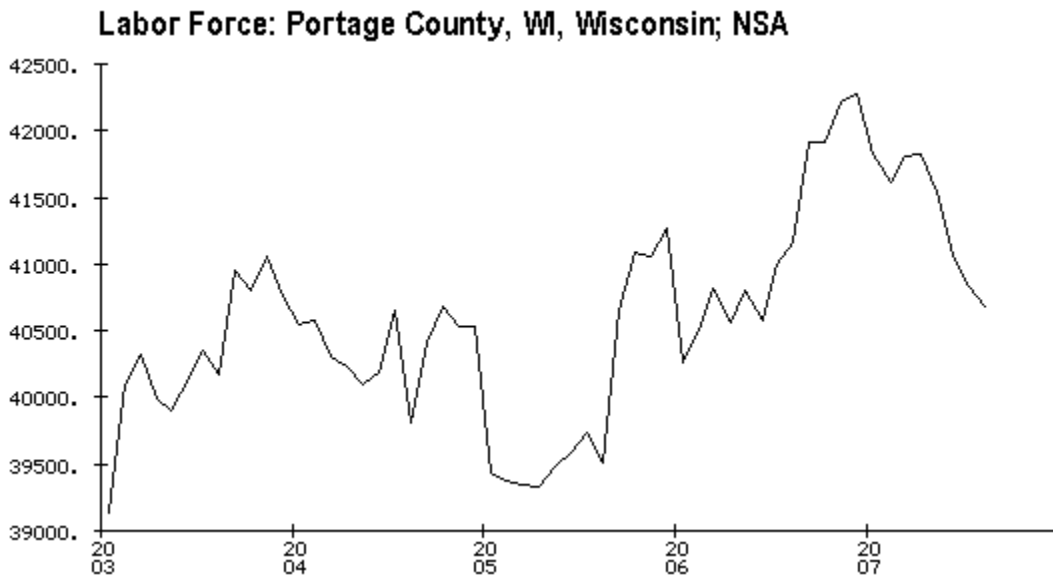


FIGURE 10



THE PHYSICIAN WORKFORCE SHORTAGE AND THE IMPLICATIONS FOR EXPANDED MEDICAL COVERAGE

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States have enacted or are considering expanded health care coverage. However, even states such as Massachusetts that are considered to have a large physician base suffer from an insufficient number of providers to meet the needs of their constituents. It is incumbent upon policymakers to increase physician supply. The goal of physician workforce policy is getting the right number of physicians into the right specialties and in the right locations (Grumbach, 2002). Even before one gets into a discussion of how to accomplish this feat, one needs to estimate future overall demand, specialty and geographic distribution, and projected supply of physicians, a daunting task. Maintaining current physician population ratios is inadequate because as the population ages demand will increase, and how physicians do their work also will change as new discoveries and technological developments alter what physicians do (Richmond and Fein, 2005, pp. 203-204). In the last few decades, the U.S. has experienced a vast change in medical organization with the rise of large medical systems (such as HMOs and hospital owned clinics), altering the utilization of physicians and physician extenders, while emphasizing managed care. It is therefore perilous to assume that the future medical organization will simply be an extension of contemporary trends. This paper focuses on the predicted physician shortage, examining supply and demand factors affecting the physician workforce. Particular attention is devoted to physician organizations' positions on the shortage and policy options to meet the impending problem.

WILL THERE ACTUALLY BE A PHYSICIAN SHORTAGE OR WILL WE HAVE A PHYSICIAN GLUT?

For some time physician organizations, such as the American Medical Association, have maintained that there was an oversupply of physicians and that expansion of medical school slots and residencies was inappropriate. Of course, this viewpoint had a degree of self-interest in that an increase in supply could result in reduced compensation with fewer patients per physician and the medical organizations being able to fill their positions without offering higher salaries or extensive signing bonuses. The Council on Graduate Medical Education in 1991 predicted a surplus of 80,000 physicians by 2000 and recommended limiting the number of residencies to 10% above the number of U.S. medical graduates. This proposed cap was aimed specifically at graduates of schools outside of the U.S., who had increasingly gained residency training in the U.S., and ultimately practiced in the U.S. This added to the supply that the COGME thought was excessive.

Government, business, and health insurers had a different take on the issue, but came to the same conclusion that the U.S. did not want to increase physician supply. Their view was that health care is characterized by market failure where workforce supply expansion was not likely to reduce reimbursements and save money. Rather, supply expansion would induce more demand and more physicians, especially specialists, resulting in higher total health care costs.

Concern about oversupply was incorporated in policy. Medical schools, which had expanded in number in the 1960s and 1970s as a consequence of federal policy to increase the number of physicians, now remained relatively constant with few new medical schools. However, even if U.S. schools were not increasing, an increasing number of students from foreign medical schools came to the U.S. for training with many staying permanently. To reduce the number of physicians trained, the federal government included in the Balanced Budget Act of 1997 an incentive for hospitals to reduce the number of residency slots available. This policy was modeled on an experiment to reduce residencies that had been implemented in New York State.

In the early 2000s, opinions of major medical organizations on this issue radically changed. The American Medical Association and the Council on Graduate Medical Education, among other physician groups, now recognized that a shortage, not a glut, looms large. Each has called for a significant increase in the training of physicians to meet the growing and aging population as a significant percent of physicians retire. A shortage would mean long waits for appointments and medical procedures. Richard Cooper, former medical school dean at the Medical College of Wisconsin and now a professor at the University of Pennsylvania, has written extensively on this subject, issuing a clarion call for the medical profession to recognize and meet the problem. He and Linda Aiken of the University of Pennsylvania have formed the Council on Physician and Nurse Supply, intended to assess the problem and develop a strategic plan to meet it.

Everyone though is not convinced that a significant shortage will in fact occur. An editorial in the *Annals of Internal Medicine* questions it (Garber and Sox, 2004). Garber and Sox argue that Cooper relied upon a static model. Change will alter the relationship between the demand and supply of physicians. The editorial notes that seniors will be healthier in the future than in the past and technological change will modify workforce needs. Of particular concern in Garber and Sox's editorial is that a significant increase in physician supply may create its own demand without truly improving health but instead, lead to increasing costs (Garber and Sox, 2004, p.733). An alternate possibility is that with insurance plans emphasizing an increasing co-payment from patients to make them price sensitive, the result may be less demand for physician services at a time that the number of providers has been increased. Until firmer understanding of the future physician workforce needs is available, Garber and Sox urge prudence—that significant expenses should not be incurred in building new medical schools to meet a demand that may not exist.

In the next sections, changes in demand and supply will be examined.

DEMAND ISSUES

Richard Cooper and colleagues challenged the potential glut conclusion, arguing that the U.S. will experience a shortage of around 200,000 physicians between 2020 and 2025 (Cooper, et al, 2002). Cooper had identified the need for expansion over a decade ago (Cooper, 1994a). To forecast needed supply, Cooper and associates developed a model based upon economic expansion, population growth, physician work effort, and services provided by non-physician clinicians. They argued that increased GDP results in increased demand for medical services. In specific investigation of this phenomena, Cooper and associates' study reveals a coefficient of determination of .78 between a change in health employment five years after a change in GDP and an $R^2_{lag5}=.59$ for health expenditures. The correlations though were not strong for contemporary relationships. The lag shows that change in health employment and expenditures follows changes in the economy (Cooper, et al., 2003). The GDP relationship to medical expenditures has at least two explanation elements. With a higher GDP, individuals have more income and more health coverage and therefore can afford more medical services. But also with income comes a change in social expectations, driving additional consumer demand. For example, in the U.S. today there is a growing demand for cosmetic surgery, a highly income-dependent service.

A second factor in Cooper's model is growth in the U.S. population, which increased from 285 million in 2000 to 300 million in October 2006. A larger population requires more clinicians, including some combination of physicians and non-physicians. Most notably, the U.S. population is aging as the first baby boomers turned 60 in 2006 with a significant increase in those 85 years and older. Between 2000 and 2039 the number of Americans over 65 will grow by 35 million (Salsberg, 2005). Data reveal more doctor visits for each age cohort above 5 years old (Salsberg, 2005). In a study of Wisconsin, the projections show that while population is expected to grow by 8.8% from 1998 to 2015, physician visits are expected to increase by 13.5% (Wisconsin Hospital Association and Wisconsin Medical Society, 2004, p. 11). However, only a small percent of primary care doctors are trained in geriatrics. With elderly individuals typically having at least one chronic condition, often taking multiple medications, and having conditions more prevalent among seniors, physicians trained in geriatric medicine are needed. However, there are only about 7,000 geriatric trained physicians practicing in the U.S.

Adding to demand in Cooper's model is the availability of tests and interventions that did not exist before. Thus even a population of the same size and age will require more practitioners because more tests are available to diagnose ailments and more interventions to treat them. For example, the demand for thoracic surgeons trained in cardiac surgery multiplied when heart by-pass surgery first became available in the late 1960s. Similarly, more available diagnostic and screening procedures require more physicians. For example, at one time colon cancer was detected by a stool test for occult blood, a rigid proctoscope that could only visualize the last part of colon, or a barium G.I. series. These were typically performed by primary care physicians. Today,

the colonoscopy is considered the best screening and diagnostic procedure, using a fiber optic scope to visualize the entire large bowel. However, this procedure is typically performed by gastroenterologists, who have seen demand for their services skyrocket as more insurance companies are willing to pay for individuals over 50 to be screened every ten years (and more often if polyps are found). Removal of pre-cancerous growth is among the most effective ways of preventing cancer from developing. The combination of more available procedures and the aging of the population significantly increases demand (Etzioni, et al., 2003).

SUPPLY ISSUES

There has been a growth in the number of physicians over the years, reflected in the physician to 100,000 population ratio shown in Table 1. Projections anticipate that with expected physician retirements, the number of physicians per 100,000 populations will level off around 2015 and then decline (Salsberg, 2005). Currently one-third of practicing physicians are age 55 and over. In comparison to other developed nations, the U.S. has fewer physicians per 1,000 people than many developed nations. For example, the 2004 data show that the U.S. had 2.3 physicians per 1,000 population in comparison to France and Germany with 3.4 and Italy with 4.2. The U.S had the same ratio of physicians to population as Britain and slightly more than Canada that had a ratio of 2.1 physicians per 1,000 people. Many nations have more physicians per 1,000 population than the U.S. as shown in Table 2 (OECD, 2006). Visits to physicians also are more frequent in other nations than in the U.S. Thus, a significant explanation for the greater amount that the U.S. spends per person and the greater percent of the GDP spent on medical care in the U.S. in contrast to other nations has more to do with higher prices than medical care received (Anderson, et al., 2003).

Table 1

Non-Federal Physician to 100,000 Population Ratio	
Year	Ratio
1980	195
1985	220
1990	237
1995	267
2000	288
2002	288

Source: American Medical Association (2006)

Table 2

Physician per 1,000 Population Among Developed Countries- 2004	
Country	Ratio
Greece	4.9
Italy	4.2
Belgium	4
Switzerland	3.8
Netherlands	3.6
Austria	3.5
France	3.4
Germany	3.4
Slovak Republic	3.4
Denmark	3
United States	2.3
Canada	2.1

Source: OECD (2006)

The U.S.'s increased ratio of physicians to population (Table 1) masks at least two elements: the decline in workforce effort and the increased fractionalization of the physician workforce. The declining effort is included in Cooper's model. Older physicians tend to work fewer hours as they approach retirement. Younger physicians will also work fewer hours than their older colleagues since they are more concerned about maintaining personal and family time than their older colleagues were when they were young (Wisconsin Hospital Association and the Wisconsin Medical Society, 2004, p. 13; Cooper, et al., 2002). Many of these physicians work for large health systems that provide more regular hours than physicians expect when they are in solo practice or a practice with a few partners. Some have hypothesized that the recently imposed restrictions on the number of hours that residents are allowed to work (80 hours a week) will carry over to a more limited work week for physicians than was the past practice. Additionally, female physicians, the data show, are more likely to work fewer hours, many even part-time, after they have children. With the growth in the percent of physicians who are women, work effort is reduced and more physicians are needed (Cooper, et al. 2002).

The medical workforce also has become increasingly fractionalized as more specialties and subspecialties emerge. For example, a growing subspecialty in cardiology is electrophysiology, where physicians focus on the electrical system of the heart. Through new ablation techniques, these electrophysiologists are able to eliminate extra calcium channels in the heart, thus correcting an irregular heart beat. Another recently developed subspecialty is the hospitalist, who only see patients admitted to the hospital, thus relieving the family practitioner or office based internist from the task of managing their patients' care once admitted to the hospital. Demand

for hospitalists has skyrocketed. A similar subspecialty of internal medicine is the intensivists, who typically provide care in the Intensive Care Unit (ICU). These physicians are trained and experienced in the care of critically ill patients. Even long standing specialties are subdividing. Orthopedists can be found focusing on the spine, hand, or adult joint replacements, to mention a few. With patients no longer receiving most of their care from their primary care physician or even the traditional specialist, the ratio of physicians to population needs to increase considerably to account for these trends.

Although the 125 medical schools in the U.S. have recently increased their enrollment, it has been insufficient to meet projected demand. Enrollment of first year students in 2006 was about 17,200, which marked a 2.2% increase over the previous year. Osteopathic schools, whose graduates are now accepted on par with M.D.s, have also increased their enrollment, although their contribution to the supply remains small—about 46,000 D.O.s in active practice. The Council on Graduate Medical Education (COGME) now recommends an increase in enrollment in medical schools of 30% from their 2002 level over the next 15 years (Council on Graduate Medical Education, 2006). Even if this is accomplished, it will not fill the deficit of 200,000 physicians predicted by Cooper. The COGME, which argued that the U.S. has a physician glut, now estimates a 150,000 shortage. With the number of new physicians graduating from U.S. medical schools now about equaling the number retiring, the U.S. will rely even more heavily on graduates of foreign medical schools, known as International Medical Graduates (IMGs), who now constitute 23% of practicing physicians in the U.S.

COUNTER-TRENDS

A fourth factor in Cooper's model, a counter-trend to increased supply needs, is called the substitution effect, the use of non-physician clinicians, including nurse practitioners, physician assistants, and mid-wives. Once limited in the services they could provide, most state licensing laws now allow them to provide services that previously could only be provided by physicians. Although a significant number of these non-physician clinicians practice primary care, many are now providing care in specialty areas (Weiner, 2004, p. 54). The conventional wisdom is that the workforce shortage is in primary care where non-physician practitioners can have the most significant impact in filling the gap by providing routine care. Specialty care areas, many argue, either have only a small shortage or even a surplus, except for a few areas. More will be said when distribution issues are examined.

Another counter-trend relates to technology and calls for technological developments to simplify procedures. Procedures such as colonoscopy, echocardiography, and others have increased demand for specialized physicians, but technological developments could simplify them, allowing primary care doctors to provide these services as a routine part of care, thus reducing demand for specialists (Crossen, 2004, p. 63).

Another counter-trend which could reduce the number of physicians needed is one in which specialists are able to provide services that formerly only specialists in a different area provided. Thus, overlapping roles could reduce the total number of physicians needed. An example of this overlap is in angioplasty. Once the province of the interventionist cardiologists, this treatment to open clogged coronary arteries is now done by some interventionist radiologists. Similarly, interventionist radiologists are offering ablation procedures to women with uterine fibroids (uterine cysts), reducing the need for gynecologists to do hysterectomies.

Lastly, outsourcing could be a way to reduce the need for U.S. physicians as it has for labor in other areas of the economy. Among the first use of outsourcing has been in the field of radiology. The introduction of digital imaging has allowed hospitals to send their images to other countries such as India or Australia to be read by their radiologists. This has been particularly useful at night, saving cost that would occur if local radiologists were on call to read these studies. Developments in telemedicine, intended to provide specialty consultations, particularly to rural communities, could open up the possibility of outsourced diagnoses to physicians in other countries. This would reduce needed supply of these specialists in the U.S. Both U.S. shortages and cost differentials could drive this trend. One additional outsourcing movement is known as "medical tourism." Currently representing very small numbers but expanding, medical tourism is when patients go to other countries where medical costs are less for elective procedures. India and Thailand are two countries recruiting patients from the U.S.

DISTRIBUTION ISSUES: GEOGRAPHIC AND SPECIALTY

Beyond aggregate supply and demand are issues of geographic and primary/specialty distribution. These have been of concern for many years, but predicted overall shortages heighten the need to consider them in policies adopted.

Shortages predominate in many rural and inner city communities (Cooper, 1994, p. 686) Physicians, because of life style preferences, employment of spouses, and income, prefer to locate outside of inner cities and rural area. Thus, despite several federal policies, including the development of the National Health Service Corps and Community Health Centers, and state efforts to secure physicians for these communities, Health Professional Shortage Areas (HPSAs) have increased. More than 20% of the U.S. population lives in a community designed as short of primary care physicians. The consequences are that patients in these areas receive less medical care, have delayed diagnoses and treatments, and have greater costs associated with medical care because of travel cost and the need to take more time off from work (Miller, 1989).

One goal of increasing the number of physicians in the U.S. was that the increased supply would result in a diffusion of physicians from areas with adequate supply to underserved communities. However, the diffusion notion was stymied by physician locational preference. Although some occurred, especially with IMGs, the flow was

small. Illinois, despite being among the states graduating the largest number of physicians, still remains among the worst in terms of medical shortage areas. The federal Health Service Corps has had only limited success because of budget cuts. The geographic distributional problem will be made worse as a number of physicians that have been recruited for these areas in the 1970s retire. For example, the Wisconsin Office of Rural Health Physician Placement Program reports 320 openings, including 166 specialists and 154 primary care physician slots, in the state in February 2006.

A second distributional issue is the optimal division between primary care physicians and specialists. For many years, the argument has been that too many medical graduates join the ranks of specialists, leaving an inadequate number of primary care doctors. With the income of specialists being greater than for those in primary care practices and the heightened prestige for specialists conveyed in medical school by professors, the specialist career choice is understandable. Additionally, career choice is also influenced by lifestyle and free time with specialists having more controlled hours (Richard and Fein, 2005, p. 116). The consequence often cited for an oversupply of specialists is that health care costs increase because more procedures, surgery, and tests are performed and the reimbursement rate for specialists is higher. The often cited goal is to have 50% of physicians practicing primary care. Canada now comes close to this goal, but the U.S. remains far behind with only about one third of medical school graduates becoming primary care physicians. A larger number of International Medical Graduates practicing in the U.S. do go into primary care—44% (AMA IMG Governing Council, 2006, p. 5). The actual practice of primary care is more than the often cited figures suggest because a number of specialists also practice primary care (Cooper, 1994, p. 681). For example, some pulmonologists will see patients not only for lung related diseases but also for general internal medicine.

Barbara Starfield and colleagues empirically investigated the relationship between mortality and the number of primary care doctors and specialists, using 3,075 U.S. counties from 1996 to 2000 (Starfield, et al., 2005). They found that counties with more primary care physicians (defined as office-based practices of those in general practice, family medicine, general internal medicine, or pediatrics) had a lower mortality rate, but there was no relationship between the number of specialists and mortality. They controlled for background factors associated with higher mortality such as percent of elderly, African-American, or incomes below 100% of the federal poverty line. Overall, a 20% increase in primary care physicians per 100,000 was related to a 34.6% decline in mortality per 100,000 at the state level. However, a greater number of specialists did not have a statistically significant impact. Thus, the aggregate supply of physicians is less important than their distribution (Richmond and Fein, 2005, p.204; Phillips, et al., 2005). Although everyone acknowledges that there is a shortage of some specialties and subspecialties (e.g. geriatricians, psychiatrists, and pediatric subspecialties) overall based upon their ratio to the population and their relationship to improving health (such as Starfield's findings), federal policy has emphasized primary care (Phillips, et al., 2005, p. 113).

The need for more primary care doctors also has implications for geographical distribution. Even though the U.S. has one primary care doctor for every 1,321 Americans, for non-Metropolitan Statistical Areas the ratio is 1 to 1,821 and worse for rural communities (Phillips, et al., 2005, p. 113). However, not everyone agrees with the conventional wisdom regarding the primary care shortage. Salsberg argues that the explosion of knowledge and complex treatment options require specialists. Even Kaiser Permanente, an HMO which stresses efficiency, has reduced its ratio of specialists per 100,000 enrollees by 44% between 1983 and 2001 (Salsberg, 2005; Weiner, 2004). One of the most well-known articles on this topic is Richard Coopers' "There's a Shortage of Specialists: Is Anyone Listening?" (2002). Cooper argues that the greatest need is for specialists. Although he acknowledges that there is an oversupply in some specialties such as ophthalmology, Cooper maintains that there is an abundance of primary care physicians, especially with the use of nurse practitioners and physicians assistants to see a portion of the patient load (Cooper, 2002, p. 764; Cooper, 1994, p. 683). In 2003, Cooper and associates surveyed medical school deans and state medical society executives regarding their perceptions of physician shortages. Overall, the results showed that their experiences indicated that shortages of physicians now exist, varying by practice area. Although some respondents noted significant shortages in some primary care areas, e.g., general internal medicine, in others such as general pediatrics, family practices, and obstetrics/gynecology shortages were either non-existent or small. However, in several specialties, the shortage was seen as acute. Anesthesiology and radiology led the list (Cooper, et al., 2003). Cardiologists have written of shortages in their field in the *American Journal of Cardiology*, anticipating a worsening as the population ages. A proposal by cardiologists to admit new students into cardiology fellowships after two years of general internal medicine residency is controversial. Although it would increase the number of cardiologists, it would also reduce the number of general internists, given the wide disparity in income between the two practices.

PUBLIC POLICIES TOWARD THE PHYSICIAN WORKFORCE

The 1910 Flexner Report resulted in a decline in the number of U.S. physicians. Abraham Flexner, a Carnegie Foundation for the Advancement of Teaching researcher, undertook an evaluation of the 155 medical schools in the U.S. and Canada, many of which were proprietary schools. In his report, he classified the existing schools based upon their quality, highlighting those schools that were clearly deficient in curriculum, facilities, scientific orientation, and faculty. Although reform of medical education was already underway at the time Flexner wrote, his report had a major impact on academic medicine (Cooke, et al., 2006).

The consequence was that many schools closed, reducing the number of graduates. Just before the Report in 1906, there were 162 medical schools, which had declined to 131 at the time the Report was issued. The drop accelerated, falling to only 76 schools by 1926, a number that remained fairly constant for the next 20 years. The number of graduates dropped from its peak of 5,747 in 1904 to 4,440 by 1910 to 3,047 in 1920,

resulting in a significant increase in the ratio of physicians to the population (Richmond and Fein, 2006, p. 12). Associated with the decline in number was a decline in diversity of physicians graduating as many schools for blacks and women closed (Starr, 1984).

The 1960s and 1970s saw both federal and state action to increase the physician supply. In 1963 the Health Education Facilities Act was enacted to provide federal assistance to build new medical schools and expand existing ones. States also provided funds to expand the number of physicians being graduated in their state with five new schools opening by 1963 with 10 more planned (Cooper, 2003). To encourage the enlargement of medical classes, the national government under the Health Professions Education Assistance Act in 1963 began requiring medical schools to increase their enrollment if they were to receive construction money. By 1971 the national government introduced the capitation grant, basing funding on the number of students. Discouraged that the result was that more specialists were being trained, the federal government linked the capitation grants in 1976 to the graduation of physicians intended to go into primary care. The goal was not only to increase the number of physicians in the U.S. but also to attack geographic distribution problems. The anticipation was that if more physicians graduated, the result would be diffusion of physicians to medical shortage areas. However, this did not significantly occur. In trying to attack this problem, the National Health Service Corps (NHSC) was enacted, providing loan forgiveness to physicians who were willing to serve several years in medical shortage areas. The NHSC also served as an alternative to military service, an especially valuable option to graduating physicians during the draft and Vietnam.

States worked to expand their physician supply. From 1960 to 1980 41 new medical schools and 8 new osteopathic schools were opened. Consequently, the number of graduates jumped from 7,500 in 1960 to 16,200 in 1980 (Richmond and Fein, 2006, p. 106). Beyond building new medical schools, many states stipulated the percent of students that must come from that state. The assumption was that residents of the state were most likely to remain in that state upon graduation (Richmond and Fein, 2006, p. 105). States created offices whose function was to help areas with physician shortages obtain physicians. Grants and loans to students who would locate in these areas were key tools along with assisting physicians with initial practice expenses.

Demand for services had increased as the population increased, scientific developments led to more effective services being available, and the passage of Medicare and Medicaid in 1965 insured individuals who did not have funds to pay for medical services. Even with the increased demand, medical associations were particularly concerned that the expansion in physician supply created a surplus that would negatively impact practice incomes. The American Medical Association in particular resisted efforts at any more supply expansion. It was not until after 2000 that the A.M.A. recognized that the U.S. did not have a glut of physicians, but rather a deficit. With an increase in retirements, the A.M.A. recognized that the projected shortage would get worse.

The AMA and other physician interest groups are especially concerned with the financial interests of their members. As such, they most notably have pushed for higher reimbursements, less government involvement, and restricted number of non-physician professional where competition could reduce incomes (Feldstein, 1991, p. 215-222; Feldstein, 1977) In this vain, these organizations have opposed opening of new medical schools, the liberalization of immigration laws and expansion of residencies for International Medical Graduates in the U.S., and the enhanced roles for non-physicians such as nurse practitioners, psychologists, or optometrists. Regarding the latter, for example, there is considerable opposition to having optometrists authorized to dilate pupils or treat conditions such as conjunctivitis. For psychologists, physician organizations have testified against allowing them to prescribe medication for their patients, typically requiring patients to go to psychiatrists, who are physicians, to get psychiatric drugs with periodic appointments to check on the efficacy and side effects of the drugs. These patients often also see psychologists for counseling therapy. Because there is an insufficient number of psychiatrists, especially child psychiatrists, patients may receive their prescription from their primary care provider, who may know less about psychiatric medication than psychologists, who are prohibited from prescribing in most states.

The position of physician interest groups on the expansion in the supply of physicians typically has been accepted by government decision-making because they both subscribe to the argument that there was to be a glut of physicians and fear that if demand expanded as supply did, health care costs would increase. Thus, action of Congress to limit federally subsidized residencies in the Balanced Budget Act of 1997 was not only intended to limit federal Medicare costs, but also to restrain health care costs in general by freezing the number of physicians, especially specialists, produced (Garber and Sox, 2004). Consumer oriented groups, such as the AARP, also did not support the expansion in the number of physicians because imperfections in the medical labor market meant that supply expansion would not reduce costs for their members.

With national and state projections of an increasing physician shortage, physician medical organizations have changed their positions and recognized a coming deficit, although they disagree as to its magnitude. Although Cooper has estimated the shortfall by 2025 to be about 200,000, physician groups have called for a much smaller increase. For example, the Association of American Medical Colleges (AMC) calls for an increase of 30% and the Council of Graduate Medical Education (COGME) for a 15% increase in the number of graduates. Fifteen percent represents only 2,800 more graduates per year. The COGME projects a shortfall, but about 85,000 nationally, less than half of what Cooper forecasted (Wilson, 2005, pp. 469-470; Association of American Medical Colleges, 2006a).

However, physician interest group's solution rests on market adjustments with little government involvement beyond the expansion in the number of medical schools and medical residencies (See Council on Medical Education, Rep. 8-A-05, 2005). Unlike Canada, which now determines the ratio of residencies for primary care versus

specialties, the Association of Medical Colleges strongly supports free choice of specialty for students and for residency positions for teaching hospitals (Association of Medical Colleges, 2006a, p. 7).

POLICY OPTIONS

Of the options considered, one of the most obvious is to expand the number of medical schools and the enrollment in the existing medical schools. However, analysts have suggested problems in doing this. Only one new medical school has opened in recent years, although a few more are planned.

The traditional objection that has been heard for decades is that if the enrollment was expanded, students of lesser quality would have to be admitted. This objection was voiced in the 1960s and again today. Douglas Wood, for example, writes, "One of the trade-offs would be to accept applicants who are less qualified than today's medical students. This, however, would most likely decrease the quality of medical care, with consequences that would be unacceptable to the American public" (Wood, 2003, p. 98).

Wood further argues that changes in medical education lead to smaller class sizes rather than being able to absorb more students. Rather than rely on lectures, instructional methods that concentrate on small groups, especially oriented towards problem solving, have been seen as more effective. This approach is more faculty intensive. As medical school curriculum expands, such as inclusion of new findings from the Human Genome Project that will impact practice, it will be more difficult to simultaneously expand curriculum and enrollment (Wood, 2003, pp. 98-99). With medical faculty being asked to do more research to bring in grant money and to see more patients, medical education takes third in priorities.

Most notably, medical schools are expensive, which is one reason that states have been reluctant to charter new ones in recent years. Today's average first year enrollment for a medical school is about 150 students. Thus, if the U.S. is to meet the forecasted shortage, there would have to be an additional 2,500 students, or the equivalent of 16 new medical schools. Even with increased capacity of some of the existing schools, it is doubtful that states will find the resources to open many new schools (Council on Medical Education Report, 8-A-05, 2005, p. 3).

How much of this opposition to expansion of medical school is economic protectionism? The American Medical Association, which has always played a substantial role in the accreditation of the medical schools beginning in the early 20th century, has a clear guild mentality, concerned that the expansion of medical school graduates will increase competition and reduce physicians' income (Richmond and Fein, 2005, pp. 14-15).

The projected shortage may encourage states to either expand enrollment at the existing medical schools and/or build new medical schools. Florida is the only state in recent years to open a new medical school. Beginning in 2008 Florida International

University in Miami is scheduled to open a new school with an initial beginning class of 36 students with the goal of having 480 students in their school, 120 per class. The University of Central Florida has also received approval for a new school with an intended first year class of 180. Oregon is another state seeking to open a new facility with a branch campus of the University of Oregon while Texas is expanding enrollment at its existing schools. Currently, there are 15 new allopathic schools under consideration (11 new schools and 4 regional campuses) plus 10 new osteopathic schools (9 new schools and one regional campus). The AAMC projects that five new allopathic medical schools will be open by 2015, with estimated additional enrollment from the new allopathic schools of between 455 and 530 students (American Association of Medical Colleges, 2006b, pp. 20 and 24).

While medical school enrollment had been constant for many years, in 2005-2006 there had been a 2.1% increase in enrollment, 352 more students, for a total of 17,004 first year students. A 2003 survey by Cooper and associates found that existing medical schools said they could expand 7.6% (Cooper, et al., 2003). In addition to allopathic medical schools giving the M.D. degree, Osteopathic schools, awarding the D.O. degree, have also increased enrollment with 3,889 first year students. Today, D.O.'s practices do not differ from M.D.'s except that more osteopaths go into primary care. Osteopathy graduates still represent only a small percent of practitioners.

Beyond further state and federal funding of medical schools themselves, subsidization and loan forgiveness for students, especially targeted at those who practice in underserved communities (and primary care if that is a goal), is seen as a key policy approach. The cost of medical education is high, discouraging promising undergraduates from applying and directing specialization to fields with higher average incomes. Although hiring bonuses and assistance by medical organizations in paying back loans exist, college graduates considering a possible medical career do not fully take this into account. Although medical schools through their financial aid offices do inform students about options and possibilities, this often occurs after students make application and have decided on a medical career. An upfront subsidy would increase applications from good students. This is especially needed as the number of college graduates levels off in upcoming decades.

Other factors discourage students seeking a medical education. The issue of malpractice, both the cost of insurance and perceived threats of lawsuits, has been continually in the news. Students will ask whether they want to go into a field with this risk. The policy option here would be appropriate tort reform that would reduce the cost of insurance as well as reduce non-meritorious suits. Further work in reducing the risk of malpractice, such as an electronic record and computerized prescriptions, would help as well. Along with malpractice, more physicians are being employed by large medical systems, replacing the solo practice system. These systems, although providing important benefits such as shared call, also frequently impose management techniques, such as length of time with patients that physicians believe interfere with their professional judgment. Surveys have shown that a significant percent of physicians say that they would choose another career if they had to do it all over again. This negativity

filters down to potential doctors, discouraging a choice of a medical career. Although difficult to implement, medical organizations should adopt recommendations encouraging these systems to treat physicians more as professionals than as employees.

Encouraging college students to major in science also could increase applications to medical schools (Even if the student is not a science major, medical school admission requires the student to have completed a list of specified science courses). Science teaching in America has been criticized as discouraging potential majors with science majors increasingly composed of international students in many schools. By reforming the science curriculum and teaching approach, a larger student base would be available to recruit to medical schools.

With the number of U.S. college graduates going to medical schools in other countries and ultimately practicing in the U.S., additional applicants would be available for expanded medical school slots. These students would have a better chance of passing the U.S. licensing exam with the better background provided by U.S. schools.

Under the 1997 Balance Budget Act, the number of residencies remains capped at 98,000. Under the cap, hospitals that choose to increase their residencies unilaterally will not receive additional Medicare Graduate Medicare Education (GME) dollars. But in an attempt to produce more physicians, the Centers for Medicare and Medicaid are working to reallocate unfilled residencies to hospitals that are more likely to have students to fill them. The cap and reallocation represents a health workforce planning model that the federal government has typically avoided because of a market ideology that questions the ability to accurately predict need and pressure from interest groups. However, federal subsidies for residencies and attempts to reduce federal budget deficits have led to the residency limitation. It should be noted that when the residency cap was approved, the major medical interest groups were of the view that the U.S. had a surplus. With the 21st century change in views, the 1997 cap may need to be revisited (Grumbach, 2002).

Several proposals challenge the tethering of GME to Medicare as it is neither good for Medicare financing nor for planning for physician needs. Although proposals differ in details, they often tie planning for specific physician needs to direct federal subsidy of training positions. This public funding approach is a more rational way to proceed. Given the difficulty of predicting physician needs in each specialty, some proposals simply subsidize total production, leaving the free market to affect deployment in different areas. The challenge is whether the free market will meet population needs. In the 1960s when the federal subsidies began to increase the physician supply, more physicians were trained, but a disproportion became specialists and a disappointed percent established practices in medically shortage areas (Grumbach, 2002). A 1980 report by the Graduate Medication National Advisory Committee (GMENAC) warned both of a pending oversupply of physicians and a maldistribution of physicians; their recommendation was that policy should be more planning oriented, directing physicians

in areas of need. With the Reagan Administration coming to power, ideas promoting further regulation were off the agenda (Grumbach, 2002).

With the difficulty of producing more physicians, one option is to employ them more efficiently (Salsberg, 2005, p. 117-118). This has often been the approach in managed care organization. Key to the lower physician patient ratio in organizations such as Kaiser Permanente is the use of teams, including nurse practitioners and physicians assistants to treat patients (Crosson, 2004, p. 61; Sender, 2004). Some medical schools are encouraging physicians to adopt a collaborative care model in treating patients. Other efficiency measures can also improve physician services and allow them to see more patients. Often cited is evidence-based medicine. This refers to restricting tests and treatments to those that empirical studies have shown to be effective. By eliminating non-effective actions, physicians can be both more effective and efficient. Similarly, the electronic record, often advocated to reduce errors, is also an efficiency measure. Tests, including imaging studies, are readily available to the treating physicians, eliminating wasted time in hunting for records and transporting films.

Physicians can also be better utilized with the development of telemedicine. Each community may not need a resident specialist, but primary care physicians can confer and the specialist can actually examine a patient from a distance. Although this will not end the physician shortage, telemedicine will reduce its negative impacts.

CONCLUSION

The U.S. is facing a significant deficit of physicians. Given the lead time needed to train physicians and time needed to open new medical schools and expand the enrollment of existing ones, action by the federal and state governments must occur now.

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