

***GLOBALIZATION AND THE PHYSICIAN  
WORKFORCE  
IN UNITED STATES***

***SIXTH INTERNATIONAL  
MEDICAL WORKFORCE CONFERENCE  
OTTAWA, CANADA  
APRIL 25, 2002***

**MARILYN BIVIANO  
FARZANEH MAKAREHCHI**



## EXECUTIVE SUMMARY

Globalization of the physician workforce implies that there are no national or state borders for the practice of medicine--that there exists a single set of requirements to practice medicine and that as a result, physicians meeting those requirements in one state or country could practice in other states or countries without additional requirements. If there were only one license to practice medicine in the world, the physician workforce could move more freely and more efficiently. To the degree that education and training requirements are state- or country-specific, globalization is deterred.

In the United States, the requirements for international medical graduates (IMGs--graduates of foreign medical schools) are standardized and, for the most part, equivalent to the requirements for U.S. medical graduates (USMGs). To become a licensed physician in the U.S., completion of graduate medical education, i.e. medical residency training in an accredited U.S. residency program, is required. Regardless of prior training and experience, IMG physicians wishing to practice in the U.S. are required to complete residency training in the U.S., a significant impediment to globalization of the medical workforce. All physicians-in-training, including IMGs, must pass a prescribed set of educational requirements and examinations prior to entry into U.S. graduate medical education (GME). In addition to the same licensure and examination requirements as USMGs, international medical graduates must also take the Clinical Skills Assessment (CSA) test and an English proficiency test. Currently, the CSA is administered only in Philadelphia. Foreign-trained physicians living in other countries are therefore obliged to obtain a visa to the United States and assume the travel costs of the visit and the exam.

Visa and immigration requirements are further impediments to globalization and the free flow of practicing physicians from country to country. Roughly half of the IMGs that enter medical residency training positions in the United States are on temporary visas. Of the temporary visas, about one-half are on exchange (training program) visitors' status, J-1 visas. Upon completing their residency programs, per the exchange visitor visa, they are required to return to their home country for a period of at least two years or else obtain a waiver. A U.S. waiver of the two-year return home requirement may be granted to an IMG holding a J-1 visa, in return for a minimum three-year commitment to practice in an underserved area. As a consequence, IMGs with visa waivers constitute over half of all underserved area service commitments in the United States. The U.S. in effect depends on IMGs with visa waivers to provide medical care in underserved areas. About 75 percent of the IMGs who receive waivers eventually become U.S. permanent residents.

In the United States, only 10 percent of the physician workforce are underrepresented minorities (African American, Hispanic and Native American), although these groups constitute 30 percent of the U.S. population. In the year 2000 only 2.3% of the IMGs in graduate medical education were Hispanic and only 1.4% were Black (non-Hispanic). In contrast, over 39 percent were Asian/Pacific Islanders, predominantly trainees from India (20 percent), Philippines (11 percent), Pakistan (5 percent) and South Korea (3 percent) and therefore not considered underrepresented minorities.

Telemedicine, the exportation of medical facilities and services, and distance learning have tremendous potential to help globalize the physician workforce and improve access to medical services. Although telemedicine is relatively limited in the United States, a number of commercial enterprises and academic centers in the U.S. are currently in the process of providing such services across a number of industrialized countries and increasingly in low-income countries.

## THE ECONOMICS AND ETHICS OF THE INTERNATIONAL MIGRATION OF PHYSICIANS

In the late 1700's, the British economist, Adam Smith, in *The Wealth of Nations* recognized the benefits of willing exchange, whether between two individuals within or between two countries, as beneficial to both the individuals and society. Then, in the early 1800's, David Ricardo demonstrated the principle of comparative advantage. Under comparative advantage, countries are better off if they not only trade with one another but if they plan their production with trading in mind—specializing in the production of goods which they can produce better and/or more cheaply than other countries and then trading with those countries.

In the late 1800's, with industrialization, came the neoclassical revolution in economics. To sum it up, the more capital (tools) a society had, the higher the per capita production and, in turn, the higher the per capita wages. In general, rich countries would be those with the vast accumulations of capital. In the 1920's, the implications for trade of the neoclassical revolution were more clearly identified by two Swedish economists, Heckscher and Ohlin. In essence, the Heckscher-Ohlin factor endowment or factor proportions theory more clearly explains comparative advantage and trade as a function of the supply of various factors of production, including capital.

Physical capital can move relatively easily from one (market-based) country to another. People, however, do not move around as freely as capital. Not only are there legal obstacles to migration, but families tend to be socially and culturally rooted in their country of birth and such attachments can be difficult to overcome. Even language is sometimes a formidable obstacle to migration. Paul Samuelson in the 1950's was able to show that labor mobility is not necessary for the economic benefits of free trade to hold because labor (and therefore labor mobility) is embodied in the trade of goods and services. So, while assuming the mobility of capital, trade, and many other things, Samuelson was able to algebraically demonstrate that through trade, wages and profits would be equalized between the rich and the poor countries with or without labor mobility.

The physician workforce does not fit well into this globalized trade model. First, physician services are difficult to export (and to embody in exports). While some progress has been made in telemedicine, in-person patient contact is thought to be essential for the delivery of most diagnosis and treatment. Further, in most industrialized countries, a country-specific or even state-specific license is required to practice medicine. Thus, for the most part, physicians must physically migrate in order for physician services to flow from countries with low or declining demand for physicians to countries of high or increasing demand.

Second, physician service demand has very different geographic market segments. The physician market for most developed countries is differentiated from other countries by practice requirements. In the United States, for example, some of the requirements to practice medicine can only be met through training and testing in the United States. Similarly, demand for physician services, and in turn wages, are related to the economic development of the country. In developing countries, much lower levels per capita of private or government resources are available to devote to health care, health care infrastructure, positions for physicians, and physician service payments. Thus, the segmented demand for physicians in a developing country will be relatively insensitive to physician supply. If supply were to all but disappear, little increase in physician income may be observed in developing countries. In the United States, there seems to be an insatiable appetite for physicians and health care, as evidenced by the continued per capita growth of physicians in the U.S. relative to countries like India, the Philippines and Pakistan. In 1980 the physicians per 100,000 population ratios for the US, India,

Philippines and Pakistan were 180, 40, 10 and 30 respectively. The most recent data available, for the period 1990 to 1998, show the physicians per 100,000 population ratios for the U.S., India, Philippines and Pakistan to be 270, 40, 10 and 60, respectively.

While not the only motivation, people migrate in response to economic incentives; they move from their own country to another where they can command higher wages. The consequences of such migration parallel those of capital movements. In most cases migration is beneficial to world welfare. The migrants' marginal productive contribution is reflected in the generally higher wages offered in the new country than in the old. In other words, the loss in production to the country from which they depart falls short of the higher income they command in the new country in which they settle, resulting in a net gain to the world as a whole.

When migration takes place in response to economic incentives, it raises the real income of the world as a whole. The developing countries very often cannot productively absorb people who are highly trained, because the absorptive capacity of the economy depends on its level of developments and degree of industrialization. Thus, again, it is not surprising that a large portion of physician migration occurs from developing countries to developed countries.

However, it should be noted that many foreign countries, including developing countries, have invested through their medical school training of the physicians that emigrate. Thus, in the case of physicians migrating from one country to another, it may not simply be a matter of the individual's investment in their medical training. The country of emigration may justifiably demand compensation for the losses it incurs (even when these fall short of the gains in the receiving country). Some countries, for example India, require a bond to be posted by their graduating medical students who go to the United States for graduate (residency) training. If the graduate does not return following training to practice in India for two years, the bond is lost, even if the individual holds a J-1 waiver.

Beyond investment in training, there are additional questions as to the right or wrong of depending on physicians emigrating from developing countries with poor health status and lower life expectancies to supply developed countries with the physicians they need and, at least in the U.S., substantially depending on immigrant physicians to practice in underserved areas.

While a strong case can be made for compensating the countries of emigration for their losses, the world as a whole nearly always benefits from unobstructed migration of trained labor. It rests upon the cherished principles of personal freedom of choice. It has been suggested that there are ethical or moral considerations associated with the willingness of the U.S. to accept physicians from poor countries, but the discussion has never gone much further than that. It seems the basic question is whether an individual's right to succeed according to their skills, abilities, and desire is more basic than a country's right to control an individual's future based on some perceived need for their skills. (This is a different question from whether the U.S. should utilize its abundant resources to assist poor countries through financial support.)

## **Trade Agreement- Globalization of the Physician Workforce**

The growth in free trade agreements has greatly facilitated the free movement of goods and services and to some degree, the migration of labor. Even certain professionals (most notably engineers and architects), through the standardization of education and experience requirements and reciprocity agreements, are moving more freely between countries and licensing systems. In the European Economic Community (EEC), there are clear plans to reduce national certification requirements for physicians and to adopt a uniform European Standard (Mick, et al., 1995). The United States has also taken some steps toward the development of a global market. While a small step, the framework of mutual recognition of professional competency, in place since 1989 under the U.S.-Canada Free-Trade Agreement, and the North American Free Trade Agreement (NAFTA) in 1994 are steps toward free movement of professionals.

The NAFTA agreement provides, in regard to professional service providers including physicians, specific entry rights to certain categories of professionals who meet minimum educational requirements or possess alternative credentials. Under the professional category of NAFTA, each government has agreed to facilitate the temporary entry into its territory of professionals including physicians who are citizens of other NAFTA countries. Physicians will be admitted to the United States under the NAFTA professional category only if they are licensed in their country of citizenship (Mexico and Canada). In order for physicians to practice in the United States, they must, in addition, meet all state licensing requirements in the U.S. However, NAFTA obligates each party, at both the federal and state levels, to eliminate any citizenship or permanent residency requirements to maintain a professional license or certificate.

While the NAFTA agreement encourages reciprocity among the U.S., Canada, and Mexico, some preliminary steps in this direction were taken pre-NAFTA by the U.S. and Canada. Medical schools in Canada and the U.S. are accredited by the same organization, the Liaison Committee on Medical Education (LCME), which effectively ensures that students in both countries receive the same medical education. The result is that Canadian medical graduates can apply and be accepted into a U.S. residency-training program without having to go through the Educational Commission for Foreign Medical Graduates (ECFMG) certification process alluded to in the subsection that follows. Thus, a Canadian graduate could, following a U.S. residency, become licensed to practice in the United States. The individual would still face immigration issues, however.

**CURRENT SYSTEM OF GRADUATE MEDICAL EDUCATION  
AND MEDICAL LICENSING REQUIREMENTS  
FOR INTERNATIONAL MEDICAL GRADUATES  
IN THE UNITED STATES**

Graduate Medical Education (GME) is clinical training in an accredited residency program following graduation from schools of medicine, osteopathy, dentistry and podiatry. The GME training is required for all medical graduates, including international medical graduates (IMGs), in the U.S. before obtaining medical licensure to practice medicine. Teaching hospitals serve as primary training sites for most residency programs. The number of positions available in any given year depends on a variety of factors, including the amount of funding available to the program and the program's staffing needs. The Accreditation Council for Graduate Medical Education (ACGME) is the body that accredits U.S. graduate medical education programs, i.e. residency training programs. The ACGME has established general requirements for all residencies as well as special requirements for each medical specialty.

To enter graduate medical education programs in the United States, all medical graduates, including IMGs, must pass the United States Medical Licensing Examination (USMLE). The USMLE is a three-step examination: Step 1 tests the medical graduates' basic science knowledge; Step 2, their clinical knowledge; and Step 3, their competency in patient management and treatment. All medical graduates, including IMGs, must pass the USMLE Steps 1 and 2 before entry into a residency training program and Step 3 during or after completion of the residency.

Every year, there are about 100,000 residents in 8,000 different residency programs. Of the 100,000, on the order of 25,000 are IMGs.

**Process and Requirements for IMGs to Enter GME Programs**

The Educational Commission for Foreign Medical Graduates (ECFMG), through a program of certification, assesses the readiness of IMGs to enter U.S. residency or fellowship programs accredited by ACGME. All IMGs seeking to enter an ACGME-accredited graduate medical education program must have a valid ECFMG certificate. To obtain a certificate, they must take USMLE Steps 1 and 2, as mentioned above, and in addition, must take an English proficiency test and the Clinical Skills Assessment (CSA) test. The CSA examination, which came into effect in 1998, is administered in Philadelphia, thus obliging foreign-trained physicians living in other countries to obtain a visa to the United States and incur the travel costs of the visit and the exam in order to be certified. These two examinations, CSA and English proficiency, are not required of graduates of the Liaison Committee on Medical Education (LCME) accredited medical schools, i.e., USMGs and Canadian medical graduates.

There are no formal restrictions, overall or by program, limiting the number of IMGs that enter ACGME-accredited residency training programs. However, certain specialties and programs within those specialties vary in their competitiveness. ECFMG plays no role in determining the number or mix of positions offered by residency programs or in selecting applicants to fill those positions. All decisions regarding the selection of applicants are made by the Program Directors of the residency programs.

### **Graduate Medical Education Programs-- All Residents**

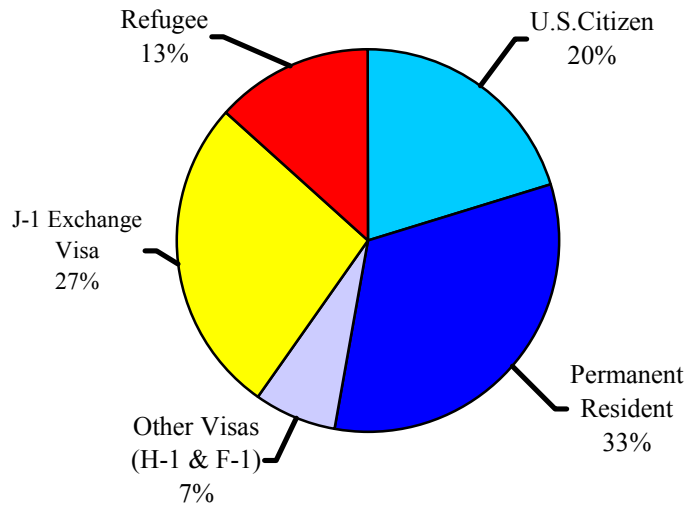
Depending on specialty, most residency programs range from 3-6 years. A resident is prepared to undertake independent medical practice within his or her chosen specialty upon satisfactory completion of a residency. To practice medicine within a particular licensing jurisdiction, individual physicians including IMG physicians must be licensed. The Board of Medical Examiners (or the equivalent) grants medical licenses in each licensing jurisdiction (the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands). Medical licensing is required for both U.S. medical graduates and international medical graduates in order to practice medicine in the U.S.

According to data from the National Resident Matching Program (NRMP) 2002, ACGME-accredited programs offered 20,606 postgraduate year one (PGY-1) positions. Of the 6,585 IMGs who were active applicants that year, 3,427 or 52% were offered positions whereas of the 16,661 USMG active applicants that year, 14,876 or 89.3% were offered positions (NRMP 2002). While the number of U.S. medical school graduates entering GME each year has remained relatively constant, the number of IMGs entering training has markedly increased, from 12,703 in 1980 to 24,707 in 2000 (AMA Masterfile, 2002-2003).

## IMGs, GRADUATE MEDICAL EDUCATION, AND CITIZENSHIP

International medical graduates constitute about 25% of physicians in graduate medical education and an equal percentage of the physician workforce in the United States. Over half of the IMGs in GME are U.S. permanent residents or citizens. Another 43 percent are temporary workers<sup>1</sup>. Of the temporary status workers, over one-half are on the J-1 exchange visitor (training) visa. The major categories of citizenship status of IMG resident physicians and their respective percentages in 1998 are illustrated in Figure 1.

**Figure 1: Citizenship Status of IMG Resident Physicians**



The Immigration and Naturalization Service (INS) grants H-1B visas to temporary professional workers who are required to have a prearranged job, either temporary or permanent, in a professional field before they receive a visa. There is an initial admission period of three years, with the possibility of extending the stay for a second three-year period. After staying in the U.S. for the maximum six-year period, a foreign citizen is required to live abroad for one year before re-entering the U.S. on an H visa.

The exchange visitor visa (J-1) has been the most frequently used visa by IMGs for graduate medical education and includes a provision of return to the country of last legal permanent residence for two years after completing GME. The only exception to the two-year home residence requirement of the J-1 visa program is through receipt of a waiver called J-1 Waiver. Most J-1 waivers are requested in the form of sponsorship by an “interested government agency” (IGA). The major sponsoring agencies of J-1 waivers for IMGs and their respective requirements are:

1. *Appalachian Regional Commission (ARC)—three year service commitment to practice in health profession shortage areas;*
2. *Department of Health and Human Services—scientific research; not patient care;*

<sup>1</sup> Temporary workers include Refugees, Exchange visitors (J-1), Students (F-1) and H-1 visa holders.



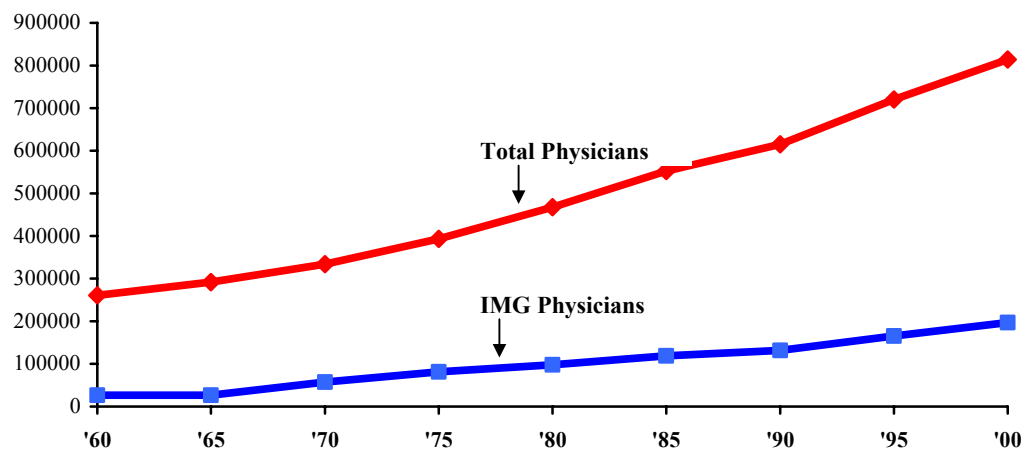
3. *Veterans Administration (VA)—three year service commitment to practice in VA hospitals;*
4. *U.S. Department of Agriculture (USDA)-three year service commitment to practice in underserved areas.*

In addition, the “Conrad provision” provides for up to 20 J-1 waivers per state per year. Thus, there is a maximum of 1000 Conrad waivers each year. Under the Conrad provision, a state is permitted to sponsor an IMG in return for a 3-year (or more) service commitment. As of 2002, 44 States had a program to request J-1 waivers (Mueller, 2002).

**IMGs AND PHYSICIAN SUPPLY,  
U.S. IMMIGRATION POLICIES,  
AND SERVICE COMMITMENTS IN UNDERSERVED AREAS**

International medical graduates have formed an important part of the U.S. physician workforce of this country since the 1960's. In the early 1960's, IMGs were about 10% (26,048) of the physician workforce; by 1970 that percentage had increased to nearly 18% (57,217). Today, IMGs are about 25% (196,961) of the U.S. physician workforce.

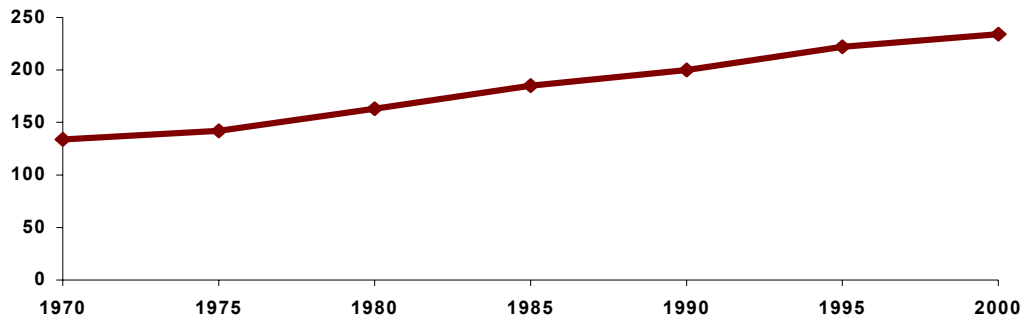
**Figure 2: USMG and IMG Physicians: 1960-2000**



Based on a perceived shortage of physicians in the 1960's and 1970's, IMGs were encouraged through immigration laws to enter the United States and participate in graduate medical education as exchange visitors. These physicians would receive advanced medical education, provide service to the hospitals in which they trained, and return to their countries with the latest U.S. medical training. Domestically, during that period of time, the annual number of U.S. medical school graduates (USMGs) doubled.

The impact of these education and immigration policies has been to double the nation's physician supply. Physician availability as measured by physician-to-population ratio increased by 70% as illustrated in Figure 3.

**Figure 3-Total Patient Care Physicians Per 100,000 Population, 1970-2000**



Over the last 10 years, many scholars, policy groups, and advisory groups have predicted excess U.S. physician supply and warned of the adverse consequences to consumers. Some organizations and individuals have advocated reducing the number of residency slots available to IMGs as the most obvious solution.

Expressing concern about physician oversupply, the Council on Graduate Medical Education (COGME) in 1995 recommended reducing the number of GME residency slots to 110% of the number of USMGs. Since then, not only COGME (1998) but other organizations and analysts (Mullan, 1997; American Association of Colleges of Osteopathic Medicine et al. 1997) have recommended reducing the number of IMGs entering the physician workforce to alleviate the predicted oversupply.

### ***IMGs and Underserved Areas***

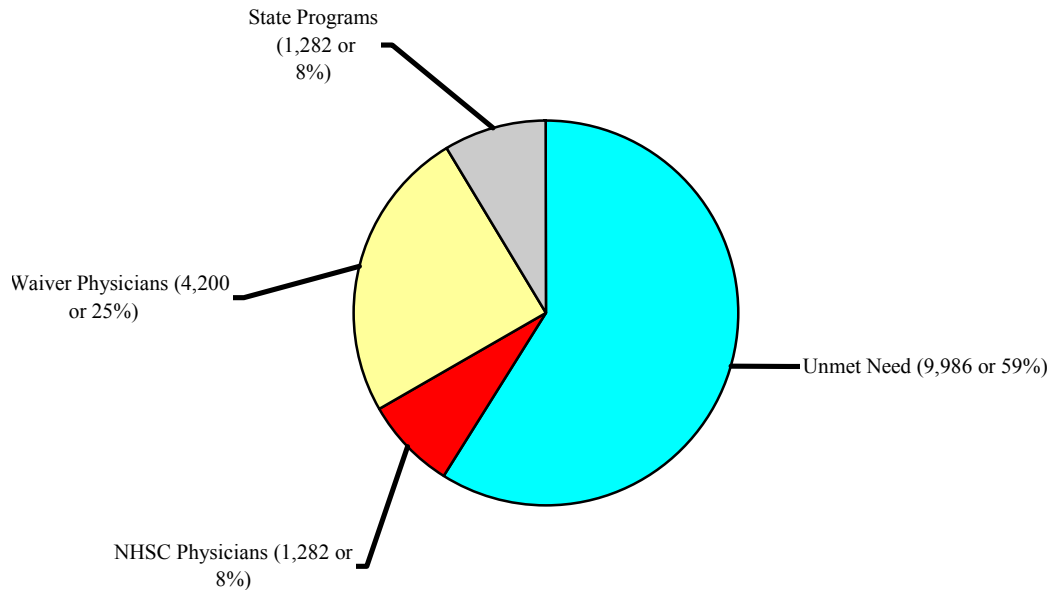
The argument for reducing the number of IMG residents is complicated by the service commitment inherent in immigration programs. Despite the large increase in physician supply over the last 30 years, there are approximately 3,000 primary care Health Professional Shortage Areas (HPSAs) in the United States. The purpose of immigration visa waivers, through which many IMGs gain permanent residency status in the United States, is to increase health care access in underserved areas. In return for a service commitment in an underserved area, an IMG who is not a U.S. permanent resident is eligible to stay in the U.S. and gain permanent residency after his or her service commitment is completed.

The total number of primary care physicians and psychiatrists needed to provide an adequate level of access to primary care and mental health is illustrated in Figure 4.<sup>2</sup> As shown, the National Health Service Corps (NHSC) covers about 8 percent of this unmet need, state scholarship and loan programs cover another 8 percent, J-1 visa waivers cover 25 percent, and 59 percent remains unmet. Currently, J-1 waivers represent about 60 percent of all underserved area service commitments.

---

<sup>2</sup> Unmet need was defined as the number of physicians needed to produce the following minimum physician-to-population ratios: Primary Care 1/2000, Mental Health 1/10,000.

**Figure 4- Service Commitments and Percent of Unmet Need of Primary Care Physicians and Psychiatrists**



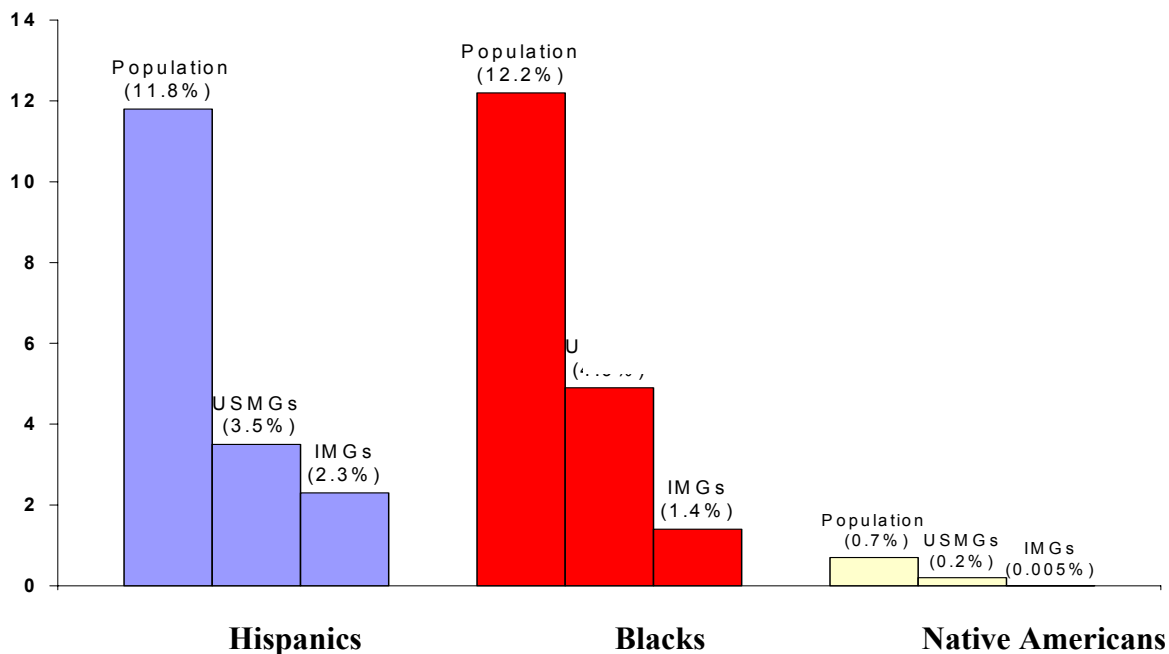
In a recent study examining the role of IMGs in rural areas (Baer, et al. 2000) IMGs were found to contribute significantly to care in rural underserved areas. Baer found that many physician shortage areas have strong concentrations of IMGs, especially in Appalachia and the South. Just over 30 percent of all rural counties have physician shortages (primary care physician-to-population ratios of 1:3000 or less). If all IMGs currently in primary care practice in rural areas were removed, one out of every five “adequately served” non-metropolitan counties would become underserved and the percentage of rural counties with physician shortages would rise from slightly under 30% to 44.4%. In addition, the number of rural counties with no primary care physicians at all would rise from 161 to 212.

## IMGs AND RACIAL/ETHNIC DIVERSITY OF THE U.S. PHYSICIAN WORKFORCE

Elimination of racial and ethnic disparities in health care has been a national goal for many years in the United States (King, et al. 2000). The U.S. health care system's ability to provide quality care to all Americans in the future hinges on its capacity to meet this goal successfully (AMA, 2000). Currently, underrepresented minorities (African American, Hispanics and Native Americans) comprise 28% of the population in the United States, expected to increase to 40% by the year 2030 (AMA, 2000), but only 10% of the current physician workforce.

While the proportion of U.S. population that are Asian/Pacific Islander is only 3.9%, over 39% of IMGs in graduate medical education are distributed as follows: India (20%), Philippines (11%), Pakistan (5%) and South Korea (3%). In fact, according to data from JAMA, in 2000 the proportion of IMG resident physicians that were Asian/Pacific Islanders was slightly higher (11.3%) than their respective USMG proportion (10.9%). In contrast, minorities that have traditionally been underrepresented among USMGs are underrepresented to an even greater degree among IMGs and today's IMG residents. In the year 2000, as shown in Figure 5, only 2.3% of the international medical graduates in GME were Hispanic and only 1.4% Black, well below their representation among both USMGs and the overall population. The Census Bureau projects that persons of Hispanic origin will be the fastest growing population in the United States, doubling from 11.8 percent in 2000 to 24.5 percent in 2050, while African Americans (not of Hispanic origin) will increase from 12.2 percent to 13.6 percent in the same time period. The importance of minorities in the U.S. physician workforce, on the basis of their critical role in the direct provision of care to minorities, has been argued for years. It is essential that the workforce better reflect the demographics of the populations they serve (AMA, 2000). However, current data do not suggest that the growth in globalization of health care has been effective in improving the race/ethnicity distribution of the U.S. physician population in such a way as to bring it in line with that of the population.

***Figure 5- Proportion of Underrepresented Minorities in the U.S. Population and among USMG and IMG Physician Residents in 2000***



## TELEMEDICINE IN THE UNITED STATES- THE IMPACT ON GLOBALIZATION OF THE PHYSICIAN WORKFORCE

Medical care and medical education in the United States are making modest progress toward globalization with the continued migration for undergraduate and graduate medical education, the development of distance education over the Internet, and the use of telemedicine. For example, in the United States, it is already possible, using telemedicine, for medical students and physicians to have a simulated encounter with an interactive patient on the Marshall University School of Medicine site, or to refine a student's or a physician's technique in arthroscopic knee surgery using virtual technology developed at the University of Hull. These examples are the beginning of a very profound change in medical education and credentialing.

Telemedicine has been identified as having the capacity to deliver care world-wide while encouraging collaborative relations between providers in many countries in real-time patient diagnosis and treatment. Telemedicine is a rapidly developing field that has the potential to redistribute high-quality medical expertise in the U.S. and globally, without having to relocate or retain the existing physician workforce. However, the rate at which telemedicine could affect the physician maldistribution is difficult to predict. According to a report by the U.S. National Rural Health Association (NRHA, 1998) telemedicine has the potential to ameliorate geographical and socioeconomic disparities in access to medical expertise and knowledge.

Multiple analytic and pilot studies have explored the impact that integration of telemedicine into the health system could have on physician workforce requirements and access to health care in the United States. Preliminary evidence suggests that telemedicine is an effective and efficient means of delivering a broad spectrum of health services to medically underserved rural and inner-city communities. Telemedicine has been identified as a potential solution in partially redressing U.S. physician shortages in rural locations (COGME, Tenth Report, 1998).

### *Scope of Services for Local and Globalized Telemedicine*

*Clinical applications---* Telemedicine technology has been identified as a potential vehicle to connect patients in rural areas to urban medical centers and provide access to a wide range of clinical services, making specialty care more accessible to underserved rural and urban populations (NRHA, 1998). Radiology, cardiology, orthopedics, dermatology, and mental health are among the most common types of tele-consultations provided in the United States. Video consultations between a physician in a rural clinic and an urban specialist could, for example, alleviate prohibitive travel and associated costs for patients (ASTHO, 1999). While telemedicine in the United States is being used primarily for specialist consultation, other applications such as management of chronic illness, emergency/triage, surgical follow-up, correctional facility care, and home health care are becoming increasingly common (ASTHO, 1999). Furthermore, telemedicine has often been used to provide a link to primary care services in outlying areas where only a physician assistant or nurse practitioner is available. Telemedicine has been used globally to provide primary and specialty care services in remote regions of the world where timely access to quality medical care is crucial. Examples of such ventures are discussed later in this paper.

*Non-clinical applications*-- In addition to improving access to clinical care for patients in a variety of settings, telemedicine systems are also being used for non-clinical applications in many rural and remote areas of the United States and the world. Examples of such services include continuing education for health professionals, administrative meetings, and demonstrations to health personnel (ASTHO,1999). Videoconferencing has opened up new possibilities for continuing education or training for isolated or rural health practitioners in the United States, who may not be able to leave their practice to partake in professional meetings or educational opportunities. Similarly, many top U.S. medical centers have through the use of telemedicine provided continued medical education and training for physicians worldwide.

### ***Barriers to Telemedicine in the United States***

In the U.S., there are several barriers to the practice of telemedicine. Many states do not allow out-of-state physicians to practice unless licensed in their state. Licensure requirements also vary from state to state, introducing the issue of whether or not states recognize certain health professions or the scope of practice of differing professions. The licensing issue is one of the important barriers in globalizing telemedicine in terms of outsourcing medical services. There are significant limitations on the type of services that could be provided by overseas physicians to patients in the United States. However, in terms of exporting services, there are numbers of successful global telemedicine models and projects, discussed later in the paper, already in place.

Reimbursement is another important impeding factor in the expansion and growth of telemedicine services in the United States and globally. Both the U.S. Centers for Medicare and Medicaid Services (formerly the Health Care Financing Administration), which provides health care benefits to elderly patients over 65 years of age, and many private insurers do not reimburse for specialty consultations via telemedicine (ASTHO, 1999). This lack of reimbursement has been a significant disincentive for providers to use and develop telemedicine technology.

Other policy issues that have been raised in the United States regarding telemedicine include how to address technology compatibility between existing systems and emerging systems, what are the implications regarding malpractice, and how to best protect privacy and confidentiality (ASTHO, 1999). Fear of malpractice suits and lack of hands-on interaction with patients are the major impediments for physicians providing services via telemedicine.

Many potential global and local telemedicine projects have been hampered by the lack of appropriate telecommunications technology. Regular telephone lines do not supply adequate bandwidth for most telemedical applications. For instance, many rural areas in the United States do not have cable wiring or other kinds of telecommunications access required for more sophisticated uses, so those who could most benefit from telemedicine may not have access to it (TRC, 2001).

### ***U.S. Trends in Globalization of Healthcare- Successful Models?***

Although telemedicine is relatively limited in the United States, there are already numbers of commercial enterprises and academic centers in the U.S. providing services across a number of industrialized countries and increasingly in low-income countries. Globalized health care in the United States has grown through increased foreign travel, worldwide sources of information to medical consumers, and joint ventures in providing services. There has been a rapid growth in international marketing by medical facilities in Europe, the United States, and elsewhere. In the United States, for

instance, Johns Hopkins increased its foreign patients to 7,200 in 1998, up from 600 in two years. Many referral hospitals in the United States market their services through physicians in the developing world. In addition, facilities in the developing nations have sought out affiliations with well-known medical schools or hospitals in the United States to enhance their reputation and to have super specialty care available.

Economic forces largely drive recent trends in U.S. healthcare globalization. Many of the top academic medical centers are expanding globally not only to supplement their revenue and ensure a patient base for service, education, and research, but also to enhance their global reputations.

In recent years, many academic medical centers have been “exporting” their expertise abroad with the intention of improving their bottom line and preserving their academic mission (Day et al., 1998). For example, Harvard Medical School established the Harvard Medical International (HMI) in 1994, with official alliances with medical schools in Korea, Thailand, Brazil and China. Moreover, HMI is also involved as a managing partner in joint ventures with local investors developing hospitals in China, Philippines, and Thailand.

Another global venture in the U.S. has been by Mayo Clinic. They have established an internationally available for-profit Mayo medical laboratory to provide esoteric laboratory tests worldwide (Day et al., 1998). Likewise, the University of Pittsburgh Medical Center (UPMC) has contracted with the Sicilian government to manage a state-of-the-art medical center complex (Day et al., 1998). UPMC transplant surgeons will be rotating to Sicily for defined periods per year, both to train Sicilian surgeons and to perform transplantation surgeries. Similarly, the Texas Medical Center (Baylor medical school affiliate) international operation office has established a number of major joint ventures, including participation with an allied health college in Peru to train laboratory, radiology and information technicians.

People living in rural and remote areas throughout the world struggle to receive access to quality specialty medical care in a timely manner. Residents of many nations often have substandard access to specialty healthcare because of shortages of trained specialists or an inadequate health care delivery system. Whether telemedicine will affect physician workforce needs globally and in the U.S. cannot be fully determined until a way is found around the barriers currently inhibiting the expansion of telemedicine. The U.S. healthcare industry stands to be a major “exporter” of a distinctively American commodity-U.S.healthcare with its established medical expertise, thereby decreasing reimbursement domestically and increasing wealth globally (Day et al., 1998)

Despite the barriers, it has been predicted that the time is coming when national identity among the health professions will be obsolete. In its place will be the truly world class physician, nurse or other healthcare professional. With encouragement of the movement of professional services as well as goods, national borders for higher education, and particularly for professional education, will become blurred. It may be reasonable to anticipate that globalization will encourage uniform medical credentialling (at least among the developed countries) which in turn will facilitate migration of the physician workforce unencumbered by national boundaries.



## REFERENCES

1. American Association of Colleges of Osteopathic Medicine, American Medical Association, American Osteopathic Association, Association of Academic Health Centers, Association of American Medical Colleges, and the National Medical Association.(1997). Consensus statement on the physician workforce.
2. American Medical Association (AMA). (1999). Immigration Information for IMGs. *AMA Online Publication*, 1999.
3. Baer, D, Thomas R, Rebecca S, et al. (2001). If Fewer International Medical Graduates Were Allowed in the US, Who Might Replace Them in Rural Areas? (Working Paper No. 71).Chapel Hill, NC: North Carolina Rural Health Research Center and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina.
4. Brown, N. What is Telemedicine, Telemedicine Coming of Age. (2001). *The Telemedicine Research Center* (TRC). Primer Publication.
5. Council on Graduate Medical Education (GOCME). (1995). Physician Workforce Funding Recommendation. *COGME Seventh Report*. Report to Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Service.
6. Council on Graduate Medical Education (COGME). (1998). International Medical Graduates, the Physician Workforce, and GME Payment Reform. *COGME Eleventh Report*. Report to Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Service.
7. Council on Graduate Medical Education (COGME). (1998). Physician Distribution and Health Care Challenges in Rural and Inner-City Areas. *COGME Tenth Report*. Report to Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Service.
8. Council on Graduate Medical Education (COGME). (2000). Physician Workforce Policies: Recent Development and Remaining Challenges in Meeting National Goals. *COGME Fifteenth Report*. Report to Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Service.
9. Day, C., Herndon, J., Fogel, D., et al. (1998). Globalization of U.S. HealthCare. University Health Center of Pittsburgh, Department of Orthopedic Surgery. 1998.
10. Gale, M., Boston, M., Robbins, A., et al. (1995). Teleradiology for Remote Diagnosis: a prospective 2-year study. *Radiology*, 197: (Suppl.):208.
11. Gustke, S., Balch, D., West, V., Rogers, L., et al. (2000). Patient Satisfaction with Telemedicine. *Telemedicine Journal*, Vol. 6 (1).
12. Hassol, A., Irvin, C., Gaumer, G., Puskin, d., et al. (1997). Rural Applications of Telemedicine. *Telemedicine Journal*, 3:215-25.

13. Johnston, B., Wheeler, L., Deuser, J., Sousa, K. (2000). Outcomes of the Kaiser Permanente Tele-home Health Research Project. *Archives of Family Medicine*, 9: 40-3.
14. Mick, S., Pfahler, M., et al. (1995). Review and Synthesis of the Literature on Foreign Medical Graduates/International Medical Graduates, 1980-1994. Report for Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services.
15. Miranda, M., Ayers, W., et al. (2000). Report for Education Commission for Foreign Medical Graduates (ECFMG). Unpublished Report.\*\*
16. Mueller, K. The Immediate and Future Role of the J-1 Visa Waiver Program for Physicians: The Consequences of Change for Rural Health Care Service Delivery. (2002). The Center for Rural Health Policy Analysis. University of Nebraska Medical Center. Report for Office of Rural Health Policy, Health Resources and Services Administration, U.S. Department of Health and Human Services.
17. Mullan, F., Politzer, R., et al. (1995). Medical Migration of the Physician Workforce: International Medical Graduates and American Medicine. *Journal of the American Medical Association*, 273 (19): 1521-27.
18. Office of Rural Health Policy. Exploratory Evaluation of Rural Applications of Telemedicine. (1997). Final Report. Health Resources and Services Administration, U.S. Department of Health and Human Services.
19. Office for Advancement of Telehealth. (2001). Telemedicine Report to Congress. Health Resources and Services Administration, U.S. Department of Health and Human Services.
20. Perednia, D., Allen, A. (1995). Telemedicine Technology and Clinical Applications. *Journal of the American Medical Association*, 273: 483-8.
21. Politzer, R., Cultice, J., et al. (1998). The Geographic Distribution of Physicians in the United States and the Contribution of International Medical Graduates. *Medical Care Research and Review*, Vol. 55 No 1, 116-130.
22. Schroeder, S. (1994). Managing the U.S. Health Care Workforce: Creating policy midst Uncertainty. *Inquiry*, (28): 266-75.
23. The National Rural Health Association (NRHA). (1998). The Role of Telemedicine in Rural Health Care. Online Publication.
24. Telemedicine Research Center (TRC). (2000). What Is Telemedicine? Telemedicine Coming of Age. TRC Primer Publication online.
25. The Association of State and Territorial Health Officials (ASTHO). (1999). Telehealth. *ASTHO Access Brief*, online publications.
26. U.S. Office of Technology Assessment. (1990). Health Care in Rural America. U.S. Government Printing Office, Washington, D.C.