The conclusions of the Workforce Study published in the supplement to this month's *Journal of the American Society of Nephrology* differ significantly for pediatric, compared with adult, nephrology. Whereas the number of trainees required to provide the needs for adult nephrology is predicted to increase over the next 15 years, the number projected for pediatric nephrology is no greater than the current number of trainees. These conclusions are based on a number of assumptions that do not account fully for differences between the missions and activities of pediatric and adult nephrologists, differences between the pools of trainees choosing nephrology, and differences between the patient populations served.

The report estimates that there are approximately 380 practicing pediatric nephrologists in the United States, compared with 5000 adult nephrologists. Although pediatric and adult nephrologists work about 2800 hours per year, the fraction of time devoted to patient care is 54% for pediatric and 71% for adult nephrologists. This is because virtually all pediatric nephrologists practice in an academic institution (with significant research and teaching responsibilities), whereas the vast majority of adult nephrologists are in private practice settings. In fact, with the exception of neonatology, over 80% of all pediatric subspecialists work in academic health care centers. In contrast, there are nearly twice as many adult cardiologists as there are pediatric subspecialists in all pediatric disciplines.

Based on information in the United States Renal Data System, the population of ESRD patients in 1995 was 5200 for pediatric and 275,000 for adult patients. The prevalence of ESRD in the year 2010 is predicted to increase to 5918 for pediatric patients and 352,000 for adult patients, respectively. The proportion of all ESRD patients in the pediatric age range would therefore remain at 1.7 to 1.9% of the total. Despite this great difference in prevalence of ESRD in the pediatric, compared with the adult, population, the fraction of nephrologists' time devoted to ESRD patients is 18% for pediatric, compared with 35% for adult, nephrologists. Thus, compared with adult nephrologists, pediatric nephrologists devote over half as much time to the care of less than 2% of all ESRD patients. These data reflect the extraordinary complexity of pediatric ESRD patients, many of whom require intensive nutritional support (tube feeding), very fine regulation of calcium/phosphorus balance, and recombinant human growth hormone injections to optimize growth and development. The 4% yearly increase in the prevalence of ESRD in the pediatric population is a consequence of decreased mortality as a result of these advances in patient management. This contrasts with the greater rate of increase in ESRD prevalence in the adult population, which is the result of the increasing incidence of ESRD in adults.

It is notable that 78 of 81 pediatric respondents to the survey questionnaire (96%) are members of the American Society of Pediatric Nephrology (ASPN). This organization, established nearly 30 years ago with Walter Heymann as its first president, now includes 430 active members. In the 1980s, surveys performed by the ASPN revealed a severe manpower shortage in the United States, with projected needs of over 50 full-time-equivalent (FTE) pediatric nephrologists in training programs and an additional 75 FTE pediatric nephrologists in institutions without training programs. Not only did the number of available positions exceed the number of fellows completing training by severalfold, but there was a maldistribution of pediatric nephrologists, with ten states having none (1).

The crisis was felt to be precipitated by a combination of factors, including a low rate of selection of pediatric nephrology fellowships (less than 0.5% of pediatric residents completing training) and an alarming rate of pediatric nephrologists changing careers. The paucity of pediatric residents choosing pediatric nephrology was attributed in part to the increase in pediatric nephrology sub-board training requirements from 2 to 3 years and the increasing trainee debt incurred for medical education. Additional reasons (accounting also for the attrition of practicing pediatric nephrologists) included the facts that patient care is time-intensive—with much time on-call working with very ill, complicated patients—but not procedure-oriented, and therefore poorly reimbursed. A major factor was the restriction of almost all pediatric ESRD patients to academic centers, thereby limiting the practice of pediatric nephrology to such centers. Moreover, the small size of most academic divisions of pediatric nephrology (mostly one or two faculty members) increased the time on-call and limited the opportunity to devote more time to research and teaching.

The ASPN responded by forming a Manpower Committee that sent representatives to hearings by the National Kidney and Urologic Diseases Advisory Board and congressional subcommittees. Because a third of pediatric nephrology fellows in American training programs were international medical graduates, efforts were mounted to encourage the Immigration and Naturalization Service to increase the number of foreign-trained pediatric nephrologists awarded permanent residency in
the United States. In addition, in 1988, in conjunction with the Sub-Board of Pediatric Nephrology, the ASPN held a national educational meeting to promote the subspecialty to potentially interested pediatric residents. Of the 62 residents invited, 15 subsequently entered pediatric nephrology fellowships. This success led to the establishment of travel fellowships offered by the ASPN to attend its annual meeting.

As a result of the ongoing efforts of the ASPN, the manpower crisis has abated: there are currently approximately 80 pediatric nephrology fellows in training in the United States. However, the majority of these trainees are international medical graduates, many of whom will return to their countries of origin upon completion of training. Moreover, what could not be predicted was the recent incursion of managed care and the shift in resources from specialty to primary care. This has already resulted in a marked reduction in the number of available positions in pediatric nephrology across the country. Because 90% of pediatric nephrologists practice in academic medical centers (compared with 35% of adult nephrologists), they will be impacted more directly by changes in medical education and by the “final rules” established recently for medical documentation by the Health Care Financing Administration.

Nonetheless, the population of patients requiring the expertise of pediatric nephrologists is likely to increase at a rate greater than that projected in the Workforce Study. As shown in the survey, the time required to care for patients on dialysis is threefold greater than that for transplant recipients. Because a greater proportion of children than adults undergo transplantation, and because the average longevity of grafts is less than 15 years, a significant number of transplanted children may need to return to dialysis by the year 2010. In addition, recent technical advances in prenatal diagnosis, the care of very-low-birthweight infants, and advances in cardiopulmonary care (such as extracorporeal membrane oxygenation) will increase the population of children with secondary renal disorders, including ESRD. Advances in heart, liver, lung, small bowel, and bone marrow transplants have already increased the pool of children requiring intensive nephrologic care. The needs for long-term rehabilitation of these children are far greater than those for adults, given the greater life expectancy of the pediatric patient. Any shortages in pediatric nephrology will compound the situation for young adult patients because they must be transitioned to the care of adult nephrologists, who themselves are likely to be in short supply.

Finally, the assumption in the Workforce Study that there will be no growth in the requirements for research for either pediatric or adult nephrologists presents a disturbing vision for the future. Hopefully, everyone will agree that prevention of ESRD is far preferable to current renal replacement therapy. As a result of advances in cell biology, the human genome project, and molecular embryology, there are greater opportunities now than ever before to elucidate the mechanisms underlying the causes of renal disease. The most exciting advances have come recently in polycystic kidney disease, but inroads in diabetes and hypertension are sure to follow. It should be noted that all of these major causes of ESRD begin in the pediatric population. Along with developmental biologists, geneticists, and immunologists, pediatric nephrologists can play a major role in elucidating these fundamental research issues. This can be accomplished only by enhancing, rather than reducing, the workforce for pediatric nephrology.

In summary, the assumptions used for the Workforce Study emphasize the manpower required to manage the clinical care of the adult ESRD population. Use of the same assumptions to estimate the manpower needs of the pediatric population is potentially misleading because it does not account for the very different missions of most pediatric, compared with adult, nephrologists. Whereas the increase in the adult ESRD population is the result of an increasing incidence of ESRD, the increase in the pediatric population is the result of a decreasing mortality. The latter is a direct result of clinical research leading to improved treatment modalities for infants and children with renal failure. Continued training of academic pediatric nephrologists should therefore remain the goal for determining manpower needs in pediatrics.

Reference