HEALTH POLICY

The TennCare Graduate Medical Education Plan: Ten Years Later

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BACKGROUND: In 1994, Tennessee converted its Medicaid program to a managed care system—TennCare. Graduate medical education (GME) funding by TennCare was linked to several workforce goals that included increasing the number of residents training in primary care and increasing the number of primary care physicians practicing in underserved areas of Tennessee.

OBJECTIVES: To determine the effects of the TennCare GME plan on GME and the physician workforce of Tennessee.

DESIGN, SETTING, AND PARTICIPANTS: Bureau of TennCare GME data from 1996–2004 and American Medical Association Physician Masterfile data through 2003.

MEASUREMENTS: Changes in filled residency positions and number of stipend supplements awarded after implementation of the TennCare GME plan. Changes in physician workforce characteristics between a 5-year period before and after implementation of TennCare.

RESULTS: Filled primary care residency positions increased from 839 (45.2%) in 1996 to 906 (47.9%) in 2000, but declined to 862 (43.5%) by 2004. Eleven of 133 available primary care stipend supplements were awarded through 2004. The percentage of physicians remaining in Tennessee after completion of residency decreased from 46.2% before TennCare to 42.4% ($P=.087$) after implementation of TennCare. U.S. medical graduates remaining in state declined by 5.8% ($P=.019$).

CONCLUSIONS: The major goals of the TennCare GME plan have not been achieved. Overall, physician retention has decreased and the number of U.S. medical graduates remaining in state has declined. State policymakers should consider other methods to increase the number of residents training in primary care and ultimately practicing in underserved areas of Tennessee.

KEY WORDS: graduate medical education; primary care; career choice; physician workforce.

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During the past 40 years, most states have supported graduate medical education (GME) through their fee-for-service Medicaid programs.¹ As Medicaid costs have increased, several states have recognized that Medicaid GME payments could be targeted to address their state health care workforce goals and have implemented programs linking GME payments to specific state physician workforce goals.^{1–4} Michigan, for example, aligned Medicaid GME payments with several public policy goals, including training an appropriate number of primary care physicians, augmenting training in rural areas, and education efforts to support the treatment of Medicaid recipients.²

On January 1, 1994, Tennessee transformed its fee-for-service Medicaid program to a managed care system—TennCare. The new program was designed to control state health care costs by enrolling all of Tennessee's Medicaid recipients into managed care organizations.⁵ Before the creation of TennCare, Tennessee's Medicaid program supported GME like most states by providing payments to hospitals using a methodology similar to the Medicare program. However, the initial TennCare budget apportioned all funds to the TennCare-managed care organizations and no funds were allocated to GME. As a result, GME funding was discontinued on January 1, 1995.⁶

In July 1995, Tennessee restored funding for GME utilizing a model designed to align GME funding with the state's physician workforce goals. TennCare GME funding was linked to the need for additional primary care physicians and the need for more physicians to practice in underserved areas; especially rural areas with few physicians providing care for TennCare recipients.⁶

The TennCare GME plan included institutional and individual incentives. The state's 4 medical schools became the recipients of all TennCare GME funds and were responsible for the distribution of funds to residents at their sites of training.⁶ Funds were allocated to each medical school based on the total number of filled PG-1 through PG-4 residency positions in all specialties, or to first specialty board eligibility, whichever was less. The total number of filled residency positions in the 4 medical schools each year was divided into available GME dollars to determine the dollars per residency position for that year. In both fiscal year 1996 and 1997, \$48

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million was allocated to the states' 4 medical schools. After 1997, the plan stipulated a yearly 5% increase in total funding over the previous year through 2000, dependent upon availability of funds.⁶ Each of the 4 medical schools was also required to make a commitment to increase the aggregate number of filled primary care residency positions to 50%. This objective conformed with the 50% recommendation by the Council on Graduate Medical Education (COGME) for increasing generalist physicians.⁷ To achieve this goal, each school was assigned a target primary care percentage based upon its historical mission.

The individual incentive was a stipend supplement designed to encourage primary care residents to practice in underserved areas of Tennessee after completion of training and thereby improving access to care for TennCare beneficiaries.⁶ Acceptance of a stipend supplement of \$15,000 per year of training required 1 year of primary care practice in an underserved area of Tennessee for each year the stipend was received. The number of stipend supplements allocated to each medical school for award to primary care residents in any year was proportional to the medical school's number of filled primary care PG-1 positions. Each medical school was responsible for recruiting and selecting residents for the program.

To evaluate the results of the plan, each of the state's 4 medical schools were required to submit to TennCare a list of all residents by name and specialty in their residency programs during July of each year. These data were used to determine the total number of filled residency positions, aggregate percentage of primary care residents, and to measure progress toward the 50% primary care goal. The TennCare GME plan also called for the creation of a system to track physicians completing residency programs sponsored by the states' 4 medical schools. Each medical school would track all residents through their residency and location of practice or employment after completion of training. The medical schools would submit these data to TennCare for all residents who completed training on or after June 30, 1995. However, it appears that TennCare did not archive these reports submitted by the medical schools.

Herein, we describe the changes in percentages of filled primary care residency positions sponsored by the state's 4 medical schools, the number of Tennessee primary care residents awarded a TennCare stipend supplement, and selected trends in the Tennessee physician workforce after the implementation of TennCare.

METHODS

Data regarding the number of filled primary care residency positions was obtained from the Bureau of TennCare. Data for each of the 4 Tennessee medical schools included number and

percentage of filled primary care and specialty residency positions for 1996 through 2004. Data for the primary care resident stipend supplement program were also obtained from the Bureau of TennCare and included the year of the award, number of awards, and duration of each award. Data were obtained from the beginning of the program in 1996 through 2004.

Data regarding the location of practice or employment after completion of residency training were not available from TennCare. Similar data in the American Medical Association (AMA) Physician Masterfile was used to examine trends in Tennessee GME and the Tennessee physician workforce after implementation of the TennCare GME plan. The AMA Physician Masterfile as of December 2003 was used to obtain information pertaining to the Tennessee physician workforce. Physician characteristics extracted from the Masterfile included the graduating medical school, type and location of last GME training, year of completion of last GME training, type of practice, specialty, and current practice location. Physician specialty was classified as primary care or nonprimary care. Primary care specialties were defined by the Bureau of TennCare as general practice, family practice, internal medicine, pediatrics, internal medicine-pediatrics, and obstetrics-gynecology. All active, nonfederal, allopathic physicians whose major professional activity was not listed as administration, military, or research were included in the study.

Tennessee physician workforce trends were analyzed by comparing physicians who completed their last GME training during the 5-year period before the implementation of TennCare (1989–1993; pre-TC) to those completing training during the 5-year period after implementation of the TennCare GME plan (1996–2000; post-TC). Data from 1994 and 1995 were excluded because of the transition from the previous state Medicaid system to TennCare during this period. Results were compared using the chi-squared test. *P* values $\leq .05$ were considered statistically significant. The University of Tennessee Health Science Center Institutional Review Board approved the research protocol.

RESULTS

In 1996, the first year of the TennCare GME plan, the aggregate total of filled primary care positions was 839; 45.2% of the total filled residency positions (Table 1). By July 2000, the number of filled primary care positions had increased to 906 (47.9%). During this period, there was an aggregate increase of 67 primary care residency positions and an aggregate decrease of 30 nonprimary care positions. By 2004 the number of filled primary care positions had decreased to 862 (43.5%).

Between 1996 and 2004, the TennCare GME plan funded 133 primary care stipend supplements. During this period, 11

Table 1. Filled Residency Positions 1996–2004

Filled Positions	1996	1997	1998	1999	2000	2001	2002	2003	2004
Primary care	839	876	919	921	906	882	851	858	862
Nonprimary care	1,016	976	966	977	986	980	996	1,036	1,121
Total	1,855	1,852	1,885	1,898	1,892	1,862	1,847	1,894	1,983
Percentage primary care	45.2	47.3	48.8	48.5	47.9	47.4	46.1	45.3	43.5

(8.3%) stipend supplements were awarded to 10 family practice residents and 1 pediatrics resident. The duration of each stipend supplement varied between 1 and 3 years. Duration of the stipends varied based upon the year of residency at the time of application to the program. No stipend supplements were awarded after 2003.

Data from the 2003 AMA Physician Masterfile identified 757 physicians who completed their last GME training in Tennessee from 1989–1993 and 1,487 physicians who completed their last GME from 1996–2000. During the pre-TC period, 83.9% of these physicians were graduates of U.S. medical schools (USMGs) and 16.1% were graduates of international medical schools (IMGs). During the post-TC period, 78.3% of these physicians were USMGs and 21.7% were IMGs ($P=.002$).

The percentage of USMGs and IMGs completing primary care residencies was 17.2% during both the pre-TC and post-TC periods. The percentage of physicians completing specialty residencies in Tennessee who were IMGs increased from 15.3% in 1989–1993 to 25.6% in 1996–2000 ($P=.001$).

During the pre-TC period, 46.2% of all physicians who completed their last GME in Tennessee remained in the state, compared to 42.4% between 1996 and 2000 ($P=.087$). The percentage of primary care physicians remaining in the state decreased from 51.5% to 47.7% ($P=.25$), whereas the percentage of nonprimary care physicians decreased from 42.2% to 37.6% ($P=.13$) during these periods. Among USMGs, 47.1% remained in Tennessee before TennCare, whereas only 41.3% remained during the post-TennCare period ($P=.019$). Among international medical graduates, 41.8% remained in Tennessee during the pre-TennCare period, whereas 46.3% remained in state during the post-TennCare period ($P=.45$).

DISCUSSION

The rapid and abrupt transition from Tennessee's Medicaid fee-for-service system to the capitated TennCare program excluded funding for GME. In January 1995, the new governor created a TennCare roundtable to advise the administration concerning improvement of the TennCare program. The roundtable recommended restoration of GME payments with funds following residents to their sites of training.⁸ A new GME funding method was developed by the TennCare GME Working Group, which included TennCare officials and representatives from the 4 medical schools, physicians, hospitals, health care systems, and the community.⁶ The plan was designed to address the need for GME funding within the overall context of the state's physician workforce priorities. This included a perceived need to increase the number of residents training in primary care as well as improving access to care for citizens in rural areas and health care shortage areas. On July 1, 1995, the TennCare GME plan was implemented and included both institutional and individual incentives.

The major goal of the institutional component of the TennCare GME plan was to increase the aggregate number of filled primary care residency positions to 50% within 5 years. By July 2000, the aggregate number of filled primary care positions had increased to 47.9%. This was likely because of a net increase in primary care positions statewide, the anticipated importance of primary care physicians in managed care, and promotion of primary care careers.^{9–12} Nevertheless, by 2004 the number of filled primary care positions had de-

creased to 43.5%, paralleling the waning interest in primary care seen nationwide during this same period.^{9,13} This shift in career choice by medical students contributed to the failure in achieving the 50% primary care goal. However, TennCare officials could not foresee this trend and its negative impact on the institutional component of the GME plan.

The goal of the individual incentive of the TennCare GME plan, the primary care stipend supplement program, was to increase the number of primary care physicians practicing in underserved areas of Tennessee. The amount of the stipend supplement was similar to other state-supported programs, which averaged \$14,000 per year of obligated service.¹⁴ Overall, the outcomes for these financial incentives have been good, especially loan repayment and direct financial incentive programs.¹⁵ In Tennessee, only 8.3% of the available stipend supplements were awarded and as a result this incentive has not been an effective method to retain primary care physicians. The reasons for the lack of interest in the stipend supplement program are uncertain. Because the dollar amount is similar to other programs, it is unlikely that this was a significant factor. Conversely, other factors may have contributed to the poor performance. Marketing of the program was the responsibility of the individual medical schools and was limited to distribution of informational pamphlets to new residents. In addition, neither TennCare nor the medical schools had systems to link specific practice opportunities to interested residents. It was ultimately the responsibility of the resident to locate or develop a practice opportunity in one of these areas to fulfill the payback obligation of the stipend supplement. Together, these factors may have made the program unappealing to interested residents.

State physician workforce policies in general seek to improve the retention of physicians completing residencies within the state. A nationwide survey of physicians who completed GME between the 1980s and early 1990s revealed that approximately 50% remained in the state where they completed GME training.¹⁶ This compares to a 46.2% retention rate for physicians completing GME in Tennessee during the same period. After the implementation of TennCare, this number decreased to 42.4%. Although this study cannot determine the reason for this shift in retention, several possibilities seem plausible. During the 1990s, per capita personal income in Tennessee ranked 36 among the 50 states.¹⁷ Per capita personal income is often used to measure standards of living and as an indicator of local economics. This lower overall standard of living may have been a negative factor when physicians considered practice opportunities. Nevertheless, Tennessee's per capita personal income ranking did not vary throughout this period and by itself is probably not a significant factor in the declining retention rate.

Physician dissatisfaction with the TennCare program may have contributed to the decline in physician retention. Pharmaceutical restrictions, excessive paperwork with associated delays in patient care, delays in receiving payments, and low reimbursement were common criticisms by physicians.^{18,19} In addition, the state's largest insurer, Blue Cross, required all participating physicians to accept TennCare patients. This provision known as the "cram-down" rule led almost one half of the participating physicians to drop out of the Blue Cross provider network.²⁰ Many of these physicians eventually rejoined the Blue Cross provider network; however, most remained wary of the TennCare program. These factors

associated with TennCare may have affected resident's views of the perceived market place in Tennessee. These or other reasons may have contributed to the decrease in physician retention.

Our study also revealed an increase in the relative percentage of IMGs completing specialty residencies after implementation of the TennCare GME plan. To meet the 50% primary care goal established by the plan, the aggregate percentage of filled primary care positions increased whereas the percentage of specialty positions decreased statewide. Yet, the relative percentage of USMGs and IMGs completing primary care programs did not change between the two periods. In contrast, the percentage of USMGs completing specialty residencies decreased. With fewer USMGs occupying specialty positions, IMGs increasingly filled these positions after the TennCare GME plan began. However, this finding is not unique to the TennCare GME plan as IMGs have increasingly filled gaps in the GME workforce nationwide.^{21,22}

There are several important limitations to our study. AMA Physician Masterfile data may not accurately represent results of the TennCare GME plan because these data are self-designated and errors or delays in reporting could introduce bias into the analysis.^{23,24} Our study also utilized a cross-sectional analysis of 2 periods just before and after the implementation of the TennCare GME plan and therefore may not reflect long-term trends.

Overall, our results suggest that linking TennCare GME funding with state workforce priorities has not achieved the desired results. The 50% primary care goal, similar to the COGME recommendations for increasing the number of generalist physicians, has several inherent limitations. First, states differ by the number and type of resident positions. States also vary in retention of physicians after training. Some retain large percentages of physicians whereas others have to import a number of physicians from other states.¹⁶ Hence, each state should determine its workforce needs and not rely on fixed percentages based upon national recommendations. Second, the percentage of residents entering primary care residencies is not an accurate measure of the future workforce because it frequently overestimates the number of physicians who ultimately practice primary care.²⁵ This is the result of a significant number of primary care residents entering subspecialty fellowships. Although some specialists provide primary care services, they typically do not function as the primary care physician for their patients.²⁶ Finally, at the national level the marketplace has not supported the 50% primary care recommendation and in fact recent evidence suggests a future shortage of specialty physicians.^{11,27}

Currently, there is no universally successful system that states can utilize to ensure their work force needs. A comprehensive longitudinal approach to recruiting students into primary care careers and ultimate practice in underserved areas may be a useful model. This plan would include the undergraduate and GME systems combined with a state- and community-supported system for identifying practice opportunities in underserved areas and matching these with interested students and residents. A number of medical schools have developed successful programs to identify and recruit students into primary care careers and practice in underserved areas.²⁸⁻³¹ Characteristics of medical school applicants that may predict selection of careers in primary care and practice in underserved areas include relatively lower family incomes, rural or inner city residence,

minority background, and interest in practicing in an underserved area before entry into medical school.^{32,33} An institutional incentive to develop a specific primary care curriculum might encourage medical schools to recruit students with these characteristics. Rural and/or inner city primary care clerkships and primary care-focused elective opportunities for students in this curriculum would help maintain interest in primary care careers.³⁴⁻³⁶ Additional incentive programs such as loan forgiveness programs based upon each year worked in a medically underserved area with no income limit may improve recruitment of these students. This incentive would ultimately require state and local community funding but may be more effective for long-term retention of primary care physicians. Medical schools would require a primary care student administrator to serve as liaison between students and communities with practice opportunities. The GME component would include direct financial incentives for those students who select primary care residencies in state and ultimately practice primary care in an underserved area. This incentive is particularly useful because many residents who graduate from in-state medical schools will ultimately remain in-state for practice.^{16,37} State policymakers should work closely with leaders from both undergraduate and GME as well as local communities to develop a primary care workforce plan that identifies specific factors that may be the most effective in attracting students into primary care residencies and eventual practice in underserved areas.

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