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Allied Health in Tennessee: A Supply and Demand Study

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Abstract: Health reform is a continuing state and national issue, and demands will increase for various health care disciplines at varying levels of training. In Fall 1992, the Tennessee Board of Regents System (TBR) appointed a task force to conduct a study that would provide data and information to assist institutions and the TBR in making responsible decisions relative to programming in allied health. This study describes the employment status of various allied health professions at the national, regional, and Tennessee levels, provides current supply information for Tennessee, identifies areas of need, and gives Tennessee and national employment projections for twenty-five occupations grouped into seven major categories. Tennessee has fewer allied health care workers in most categories when compared to the nation, as well as significant shortages in several areas. State institutions are using this baseline data in institutional program planning. The study provides a model for similar longitudinal studies that could be performed by communities of interest.

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Allied health services have significant implications for the quality of health care for Tennessee citizens. Allied health education is a high cost program area compared to many other curricula. In times of fiscal constraint, changing demographics, and increased use of technology, public post-secondary institutions must plan carefully to meet expectations for improved health care. This article describes the rationale, methodology, and findings of a state-wide assessment of allied health manpower in Tennessee.

To assist its institutions and the Tennessee Board of Regents (TBR) System in making responsible decisions relative to programming, the Chancellor requested a study on allied health. In December 1993, a state-wide task force of allied health faculty and staff completed and disseminated the final report.

The Tennessee Board of Regents is the sixth largest postsecondary governing system in the US, including six universities, 14 two-year community colleges, and 26 technology centers, serving over 165,000 students. TBR has responded to demands for more health care professionals, and since 1989, both enrollments and the number of graduates from health programs have nearly doubled. Much of this growth has occurred at the two-year institutional level.

In the allied health area, TBR offers more than 70 accredited allied health programs at all levels, from technology centers to two-and four-year schools. These programs are both credit and non-credit and range from certificate to doctoral levels. Some programs are based on a partnership model with clinical instruction delivered by other educational and medical institutions outside TBR.

The allied health field is multi-disciplinary, and the choices of scope and methodology for effective manpower studies vary. Allied health supply and demand data are not always comparable for the various professions, and some sources of data are not widely available. The format and data used for this study may be a useful model and provide baseline data as institutions research occupational supply and demand prior to developing new or modifying current programs.

Allied Health in Tennessee: A Supply and Demand Study (TBR, 1993) was made generally available to those involved in the education, training, and employment of allied health professionals. The report has eight sections and describes the employment status of various allied health professions at the national, regional, and state levels. It provides current supply information at the state level, identifies areas of need, and gives general Tennessee and national employment projections.

The study includes a status summary of the allied health occupations studied, provides a description of the category, describes briefly the educational preparation for the occupations, reviews supply and demand information, identifies post-secondary educational programs in Tennessee, and summarizes the section. References and seven appendices are also included in the final report.

### Methodology

As the Institute of Medicine (1989) study noted, the allied health field “comprises occupations with varying labor market characteristics, ” including levels of education and responsibility, work sites, paths of entry, wages, and job titles and descriptions; therefore, each occupation must be considered separately. The diversity of the fields and the lack of

federal investment in establishing national databases contributes to the lack of consistent national data (IOM, 1989, p. 445). A hierarchy of methods and models described by Wing and Salsberg (1992) recommends the kind of simple, straight-forward analysis and data collection used as a basis of analysis in the Tennessee study. Justification of any program requires more detailed projections and analysis.

Like the IOM (1989) study, this study (a) used primarily existing data, (b) selected several allied health fields to study in depth, (c) identified demand rather than need in looking at health care, (d) and took into account general trends and the available data. The data was used to make recommendations for programming.

The report covered selected occupations in the allied health field which were grouped into seven occupational categories: medical imaging, health care (medical) therapy, health information management (medical records), clinical laboratory services, dental services, medical assisting, and emergency medical services. Public health, health services administration, opticians, community health education, nutrition, dietetics, recreational therapy, music therapy, cardiopulmonary technology, orthotic/ prosthetic, pharmacy assistant, substance abuse, and environmental health are areas that may be considered allied health, but are not included in this study. Pre-professional categories were not included.

The study was limited to Tennessee and incorporated data from a variety of organizations, including Tennessee post-secondary systems, the Tennessee Higher Education Commission, individual institutions, local practitioners, accrediting bodies, state regulatory agencies and departments, national agencies and reports, allied health professional organizations, and other allied health supply and demand studies.

Projected growth was predicted in some occupational areas; however, factors such as repayment systems, federal legislation, and level of access that are used to predict future growth continue to change rapidly. For example, federal legislation is expected to change the ability of the public school system to use baccalaureate-prepared speech disorders graduates, thus increasing the demand for master's level training.

### Description of Supply and Demand Data Types

The committee used a variety of existing data sources and a survey of local clinics and practitioners as the basis for its assessment of demand. All the data sources in supply and demand studies have both strengths and weaknesses. To increase reliability and validity, a variety of sources were considered and conclusions based on the aggregate information found within an occupation and across several occupational areas. The following sections describe the seven major data types used.

#### I. Population Ratio Data

A simple extrapolation model, health care personnel to population, was applied to determine the ratio of current health care personnel to the Tennessee population. The Bureau of Health Professions of the U.S. Department of Health and Human Services uses this method to project use of health care services. The study emphasized population ratios as a means of comparing Tennessee to national and regional figures to provide a more consistent benchmark across occupational areas. Assuming a Tennessee goal of meeting national averages as an outcomes measure, these data identify underserved areas.

Table 1 shows population ratio data for several allied health occupations in Tennessee. Ratios comparing the number of professional level practitioners to the technical level were also calculated and compared to national ratios.

## 2. Statistical Projections of Populations

The Bureau of Labor Statistics' (BLS) projections are grounded in projections of the entire U.S. economy which include estimates of workforce and economic activity. BLS uses a consistent methodology across occupations; thus, the allied health occupations can be compared with each other and in context with all other occupations for which projections have been made. Grouping of some occupational categories limits the use of these comparisons. This methodology is also used by the Tennessee Department of Employment Security.

## 3. Vacancy Rate Data

According to the IOM (1989) study, the most commonly cited indicator of a labor shortage is job vacancies, and a large number of vacant positions or a high ratio of vacancies to total employment is taken as evidence of a shortage. Vacancy rates, however, are not reliable indicators of job opportunity in that the highest rates often occur in occupations with the highest turnover, due to stress, low pay, or cyclical employment patterns. Additionally, consistent shortages may also drive the market to alternate operations, such as the increased use of contractual services or technical level personnel.

The American Hospital Association has initiated three surveys of human resources to "build a data base for use in strategic manpower planning and provide states with compara-

Table 1

Numbers and Population Ratios of Professionals in Selected Allied Health Professions: U.S. and Tennessee  
Based on 1990 U.S. Census Data

Profession	U s .	Per 100,000	TN	Per 100,000	Practicing Ratio*	
					U s .	TN
Medical Technology	87,222	35.0	1,818	37.0		
Medical Laboratory Technician	23,209	9.3	742	15.2	.26	.4
Occupational Therapist	44,174	17.8	378	7.75		
Occupational Therapy Assistant	11,232	4.5	186	3<8	.25	.5
Physical Therapist	116,573	46.8	1,741	35.6		
Physical Therapy Assistant	21,603	8.6	650	13,3	.19	.37
Registered Respiratory Therapist	47,764	19.2	1,040	21.3		
Certified Respiratory Therapy Technician	61,996	24.9	1,437	29.3	1.29	1.37
Medical Record Administrator	13,346	5.4	350	7.1		
Medical Record Technician	23,412	9.4	548	11.2	1.75	1.57
Radiographer	184,648	74,2	3,907	80.0		
Nuclear Medicine Technologist	11,022	5.6	247	6.7		
Radiation Therapist	8,679	3.5	161	3.3		
Population	U. S.: 248,709,873		TN: 4,877,185			

\* Practicing Ratio compares the number of assistant-level practitioners to the number of professionals practicing in the state and nation expressed as a ratio



tive data.” The 1991 survey covers 26 occupations and presents the gathered information by state, occupation, and region.

The American Hospital Association defines a shortage as a vacancy rate of 7% or more (Kreml, 1992), and the committee adopted the 7% vacancy rate criteria for this study. Other databases were used for professions where hospital employment is not a major factor.

In January 1993, a survey of selected medical clinics in Tennessee was conducted by the Board of Regents to collect local employment data for allied health professionals (Table 2). The survey requested numbers of full- and par-time staff employed and vacancies for each occupation identified in the study. Survey data generally confirmed other sources with regard to shortages.

#### 4. State Employment Data

State surveys based on employment by occupation are collected from employers by a questionnaire. Over time, employers may adjust to market conditions and in some ways adjust their demand requests to their perceptions of the marketplace supply. Differences in processes, equipment, the way work is organized, and the availability of less well-trained workers alter the ways employers complete these surveys.

In Tennessee, the Occupational Employment Statistics (OES) program is a three-part program administered by the Tennessee Department of Employment Security, Division of Research and Statistics, to provide current and projected occupational employment information and expected average annual openings figures. First, a statewide stratified survey of Tennessee employers is conducted over a three-year period. These data are

estimates based on trends and do not take into account unusual economic conditions or business cycles.

Second, staffing patterns were developed which represent the proportion of specific occupations that are likely to exist in particular industries. Staffing patterns are based on statewide data and do not reflect regional variations. Finally, industry employment projections are statistically developed using single and multiple regression.

The supply data generally include trained workers who were employed or are seeking work, and only includes information from public institutions. Supply figures should be adjusted upward for programs where significant numbers of graduates are being produced by private sector schools.

#### 5. Educational Data

The Southern Regional Education Board (SREB) Dat-Ex is an inventory of health and human services education programs. Though focusing on the 15-state region, the database also includes some national data.

The Tennessee Higher Education Commission (THEC) Student Information System [SIS] data provides information on public post-secondary program graduates. This information is provided by the higher education systems to THEC.

#### 6. Licensure Data

This data is provided by the Tennessee Division of Information Resources. Certification and registration data for which national registration is required for practice often provided the best source of national and state levels of personnel in the different areas.

#### 7. Professional Association Data

Sources of data for the supply of allied health workers include membership data from allied health associations. For fields that are well-defined and have a single route of entry, the association data provides a good estimate. For many allied health fields, however, association member data was incomplete or nonexistent. Another source of data on new graduates and accredited academic programming is the CAHEA directory, which included 24 allied health field occupations in 1993.

### Report Findings

Each occupational area covered by the report included a status summary, a description of the category, the educational preparation for the occupations, supply and demand information at the national, regional, and state levels, identified public postsecondary educational programs in Tennessee, and a summary. The major findings for each occupational group follow.

#### Medical Imaging

Diagnostic radiologic technology, radiation therapy technology, nuclear medicine technology, and diagnostic medical sonography.

- \* Tennessee's radiography programs are adequate to meet current and projected needs.
- \* Radiation therapy programs will need to be reviewed in order for graduates to qualify for national registration in the year 2000.
- \* Currently approved programming will reduce the demand in the nuclear medicine area.
- \* An entry-level sonography program should be considered.

### Health Care (Medical) Therapy

Audiology/speech pathology, occupational therapy, occupational therapy assistant, physical therapy, physical therapist assistant, respiratory therapy, and respiratory therapy technician.

\* Tennessee needs more master's-level speech pathologists. The supply of audiologists is currently above the national average.

\* Tennessee demonstrates a shortage of physical therapists.

\* Tennessee appears to be producing an adequate number of physical therapist assistants.

\* More occupational therapists are needed, but approved new state programming will basically meet the need for occupational therapy assistants.

\* In both levels of respiratory therapy care, Tennessee is comparable to national population ratios.

### Health Information Management (Medical Record)

Medical record administrator, medical record technician, and transcriptionist.

\* This area will have the second highest projected growth rate of all allied health professions.

\* When current medical record administration occupations programs reach capacity, state supply and demand should be reassessed.

\* Consideration should be given to state-wide distribution of medical record technician programs.

### Clinical Laboratory Services

Medical technologist, medical laboratory technician, and phlebotomist.

- \* National hospital vacancy rates are increasing.
- \* Regional figures reflect decreasing numbers of graduates, but Tennessee's ratio of graduates per 100,000 population is slightly above SREB averages.
- \* Regulations to be implemented in 1994 are expected to change the minimum requirements of medical Laboratory technicians from certification to an associate degree.
- \* Tennessee's vacancy rates are lower than most other SREB states.
- \* Tennessee's demand is slightly higher for medical laboratory technicians than for medical technologists, but current programs in both areas are below their statewide program capacity.

#### Dental Services

Dental hygienist, dental laboratory technician, and dental assistant.

- \* The population ratios of Tennessee dental services personnel to dentists compare favorably to national ratios.
- \* The demand for dental assistants should be addressed by additional programming.

#### Medical Assisting

Surgical technician, medical assistant, and nursing assistant

- \* Demands for medical assisting personnel will continue.
- \* Increases in surgical assistant programs have contributed to meeting yearly expected demand.
- \* Demand for medical and nursing assistants is high, and positions can be filled by persons with varying educational backgrounds.

\* Additional medical assisting programming should be considered.

### Emergency Medical Services

Emergency medical technician (basic, intermediate, and paramedic).

\* Tennessee depends less on volunteer medical emergency support personnel than many other states.

\* Tennessee has reached a balance between supply and demand in the emergency medical services area.

### Conclusion

Allied Health in Tennessee: A Supply and Demand Study (TBR, 1993) shows that recent academic programming initiatives by TBR and others are addressing some of the critical programming needs in allied health. Tennessee has fewer allied health care workers in most categories when compared to the nation, and consideration must be given to providing additional programming, especially in occupational areas where rapid growth is predicted in the next ten years. Practitioner to technical assistant ratios were calculated and indicated that Tennessee has a higher ratio than exists nationally in the areas of physical therapy, occupational therapy, clinical laboratory sciences, and respiratory care. These ratios may be reflecting program growth in two-year institutions, and the implications of the effect of these ratios in practice should be studied further.

The supply and demand information presented in the report is relevant, but labor market factors such as demand are only one part of the academic program planning and decision making process. Allied health programming must be evaluated in the context of an institution's overall mission. In addition to the mission, a number of factors must be

analyzed and considered, including a variety of academic programming needs; student interests; the availability of qualified faculty; accessibility to appropriately equipped classrooms, laboratories, and clinical education sites; accreditation fees and other recurring costs; and the program mix of the institution.

Demand, if expressed as need, quickly becomes a qualitative question. For example, how many respiratory therapists are needed to provide a quality level of health care for Tennesseans is a different question than how many respiratory therapy positions are currently available.

Quality issues, such as the lack of professional education or the average number of professionals per capita, need to be addressed. Generally these issues are best confronted at the local or community level, and in those instances, the local educational institutions are often best equipped to assess that need through local surveys or other assessments of specific occupational demand.

Severe shortage areas in Tennessee are reflective of shortages at the national level and include physical therapy and occupational therapy. Areas where additional programming could be considered include entry level sonography, master's level speech pathology, medical record technology, dental assisting, and medical assisting.

While changes in health care coverage and insurance reimbursement could change these assumptions, current programming is projected to meet the demand in the areas of radiography, nuclear medicine, radiation therapy technology, audiology, physical therapist assisting, occupational therapy assisting, respiratory therapy care, medical record

administration, clinical laboratory services, dental hygiene, dental laboratory technology, and emergency medical services,

In Tennessee, public institutions are providing large numbers of these allied health care providers and, with the rapidly changing context of health care reform, educational institutions and systems will need to employ a variety of sources of data as they review and plan academic programming in the allied health field.

Other states may benefit from similar studies and could compare their findings with the Tennessee status summaries. In addition to state-wide use, a review of several state studies could assist in developing a regional or national database.

In Tennessee, the publication of this study has resulted in consideration of additional allied health programming by institutions, fostered specific conversations among institutions regarding program need, provided specific baseline data and information which serve as a common base for discussion, and contributed to dialogue about the timing of a follow-up study which would show progress or continuing need. While the Board of Regents could sponsor additional studies, the opportunity exists for a coalition of allied health educators, employers, allied health care providers, and allied health care professionals to develop and support a longitudinal assessment of allied health needs in Tennessee.

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