Chapter 06 Health Personnel

High quality health care services depend on the availability of competent health personnel in sufficient numbers to meet the population's needs. Mississippi is traditionally a medically underserved state, particularly in sparsely populated rural areas and areas containing large numbers of poor people, elderly people, and minorities. This chapter discusses the areas of greatest need for health care personnel, focusing on physicians, dentists, and nurses, and recommends actions to help increase the numbers of health personnel in underserved areas.

Note: Various boards of licensure provide information for this chapter; the licensure of health professionals may not indicate whether they are currently practicing on the Mississippi Gulf Coast following Hurricane Katrina. The effect of the hurricane on health professionals practicing on the Mississippi Gulf Coast may be more apparent in licensing year 2007, which will be reported in next year's 2008 State Health Plan.

100 Physicians

The University of Mississippi Medical Center's School of Medicine has graduated 4,658 physicians, including 314 non-white physicians, since its first class in 1957. The school awarded 102 Doctor of Medicine degrees in school year 2004-2005. The class included 11 minorities, or 10.8 percent of the graduates.

Mississippi had 5,098 active medical doctors, 264 osteopaths, and 59 podiatrists licensed by the Board of Medical Licensure for licensing year 2006, for a total of 5,421 active licensed physicians practicing in the state. This number represents an increase of 116 physicians, or more than 2.13 percent, from licensing year 2005. In 2005, the Board revised its reporting policy, resulting in a decrease in the number of physicians by county in licensing year 2005. Previously, the Board reported physicians with a primary or a secondary practice location in Mississippi. Currently, the board reports only those physicians who indicate a primary practice location in Mississippi. Based on Mississippi's projected 2010 population of 2,975,551, the state has approximately one licensed physician for every 549 persons.

Approximately 15.9 percent of Mississippi's medical doctors cite the practitioner's office as their primary place of business; 23.1 percent cite clinics; 19.9 percent cite both hospitals and the practitioner's office, with no major setting determined; 17.3 percent cite hospitals; 5.6 percent cite schools of medicine; and the remainder cites federal health facilities, schools, public health, or other areas.

Approximately 2,172 (42.6 percent) of the state's active medical doctors are primary care physicians, representing a ratio of one primary care physician for every 1,370 persons, based on 2010 projected population. The primary care physicians included 711 family practitioners, 111 general practitioners, 687 internal medicine physicians, 314 obstetrical and gynecological physicians, and 349 pediatricians. Table VI-1 presents the total number of medical doctors in all specialties; Table VI-2 presents the number of physicians by sex, race, and age per primary care specialty; and Map VI-1 depicts the total number of primary care medical doctors by county.

Mississippi had 75 counties or portions of counties designated as health professional shortage areas for primary medical care for 2006. The United States Department of Health and Human Services defines a health professional shortage area (HPSA) as a geographic area encompassing 30 minutes travel time and containing at least 3,500 persons per primary care physician. Areas with 3,000 persons per primary care physician are also designated if the areas meet any one of the following three criteria: 1) more than 100 births per year per 1,000 women aged 15-44; 2) an infant mortality rate of more than 20 infant deaths per 1,000 live births; or 3) more than 20 percent of the population with incomes below the poverty level.

Degree-of-shortage designations reflect the ratio of population to the number of full-time equivalent primary care physicians and the presence or absence of unusually high needs for primary health care services as demonstrated by the three conditions listed in the previous paragraph.

Minority Physicians

Mississippi had 977 minority physicians in licensing year 2006: 450 black, 358 Asian, 29 Indian, and 140 of other races. Blacks comprised 7.6 percent of the total active licensed physicians and Asians 6.6 percent. Using a non-white population figure of 1,159,565 (38.9 percent of the total 2010 projected population); the state has one minority physician for every 1,187 non-white persons. Considering black physicians only, there is one black physician for every 2,577 non-white persons; 283 (or 70 percent) of the state's black physicians were primary care physicians.

The UMC School of Medicine has graduated a total of 314 non-white physicians, with 11 minorities included in the 2004-2005 graduating class. Mississippi needs additional minority physicians to meet the high need for medical services in rural Mississippi. This need is heightened by socioeconomic factors such as education, income, and housing conditions. All of these factors affect health status.

Osteopaths

Mississippi had 264 active osteopaths licensed for licensing year 2006, distributed as follows: 109 in family practice; 40 in emergency medicine; 9 in general practice; 10 in anesthesiology, 26 in internal medicine, 9 in pediatrics, 11 in obstetrics and gynecology, and 50 in various other specialties.

Table VI-1
Medical Doctors by Specialty
FY 2004

Adolescent Medicine	2	Neurology	85	Psychiatry	228
Aerospace Medicine	3	Neurology & Psychiatry	6	Psychiatry, Addiction	3
Allergy & Immunology	24	Neuropathology	2	Psychiatry, Child & Adolescent	21
Anesthesiology	257	Neuroradiology	2		
		Nuclear Medicine	2	Public Health & General Preventive Medicine	12
Blood Banking/Transfusion Medicine	2			Pulmonary Disease	22
		Obstetrics & Gynecology	309	Pulmonary Medicine	43
Cardiac Electrophysiology	8	Occupational Medicine	9		
Cardiology	57	Oncology	10	Radiation Oncology	26
Cardiovascular Disease	90	Ophthalmology	151	Radiation Therapy	3
Clinical Genetics (M.D.)	1	Otolaryngology	48	Radiology	78
Clinical Neurophysiology	1	Otolaryngology / Neurotology	1	Radiology, Diagnostic	146
Critical Care Medicine	2	Otorhinolaryngology	49	Radiology, Vascular & Interventional	17
Cytopathology	2				
		Pain Management	12	Rheumatology	28
Dermatology	48	Pathology, Anatomic	6	Roentgenology	1
Dermatopathology	2	Pathology, Anatomic & Lab Medicine	4	Roentgenology, Diagnostic	5
		Pathology, Anatomic / Clinical	106		
Emergency Medicine	254	Pathology, Clinical	3	Sports Medicine	2
Endocrinology	3	Pathology, Forensic	1		
Endocrinology, Diabetes, & Metabolism	16				
Endocrinology, Reproductive	3	Pediatric Allergy & Immunology	1	Surgery	17
		Pediatric Cardiology	5	Surgery, Facial Plastic	2
Family Practice	711	Pediatric Critical Care Medicine	3	Surgery, General	209
		Pediatric Endocrinology	1	Surgery, General / Vascular	20
Gastroenterology	86	Pediatric Gastroenterology	2	Surgery, Hand	2
General Practice	111	Pediatric Hematology / Oncology	2	Surgery, Neurological	57
Geriatric Medicine	5	Pediatric Infectious Disease	1	Surgery, OB / GYN	4
Gynecologic Oncology	5	Pediatric Nephrology	1	Surgery, Orthopaedic	184
		Pediatric Neurology	4	Surgery, Otorhinolaryngology & Facial Plastic	7
Hematology	1	Pediatric Otolaryngology	1	Surgery, Pediatric	4
Hematology & Oncology	16	Pediatric Pathology	1	Surgery, Plastic	10
		Pediatric Pulmonology	2	Surgery, Plastic & Reconstructive	41
Infectious Diseases	21	Pediatric Radiology	1	Surgery, Thoracic	9
Internal Medicine	687	Pediatric Sports Medicine	1	Surgery, Thoracic / Cardiovascular	41
Laboratory Medicine	1	Pediatrics	324	Surgery, Urological	31
Maternal & Fetal Medicine	5	Physical Medicine & Rehab	21	Undersea Medicine	1
Medical Genetics	4	Preventive / Aerospace Medicine	3	Urology	64
Medical Oncology	28	Preventive / Occupational - Environmental Medicine	1		
		Preventive Medicine / Occupational Medicine	1	Other & Unknown	49
Neonatal & Perinatal Medicine	12				
Neonatology	5				
Nephrology	56			**Total**	**5,098**

Table VI-2
Medical Doctors in Mississippi – Federal and Nonfederal
Specialty by Sex, Race, and Age
License Year 2006

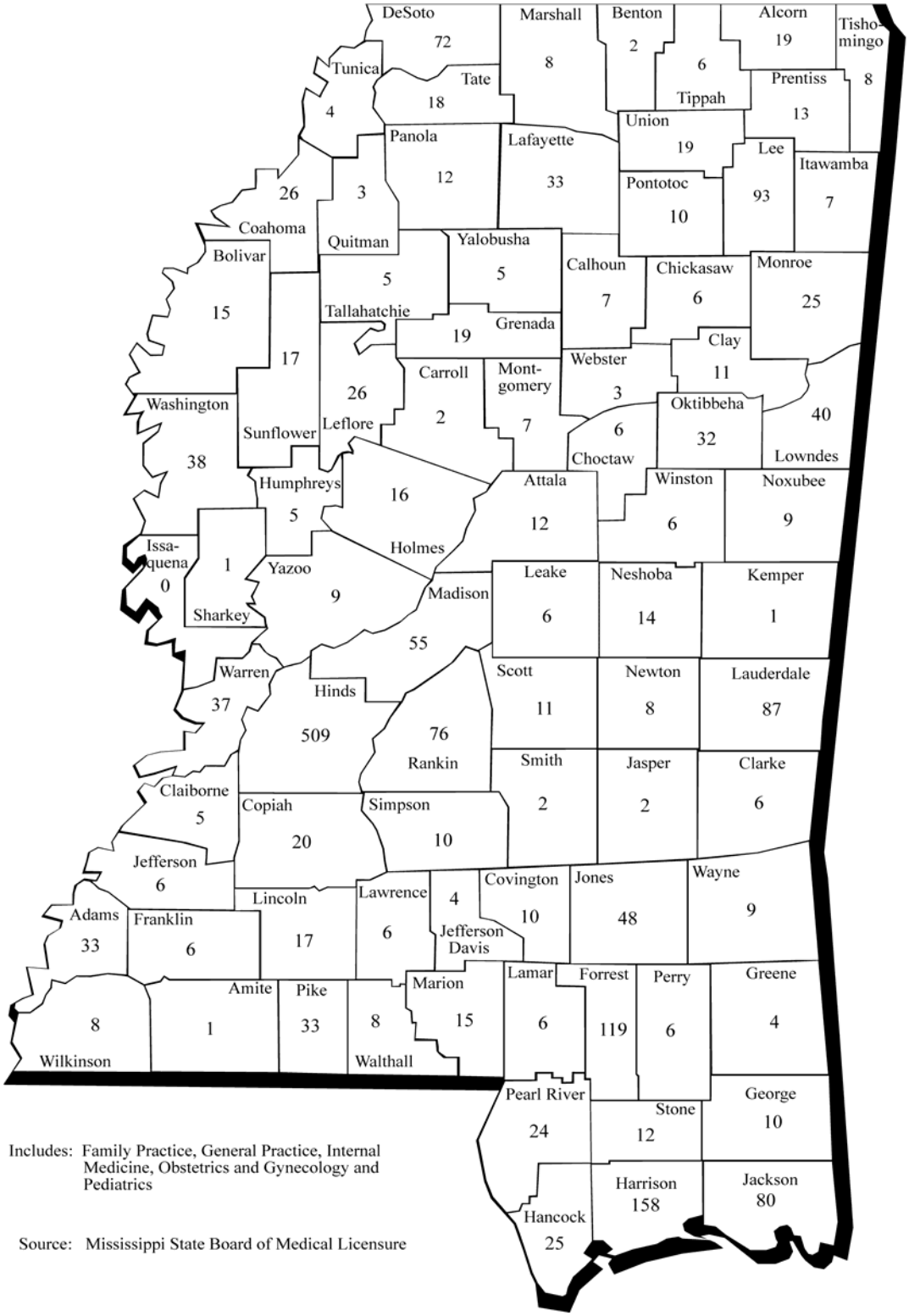
	Family Practice	General Practice	Internal Medicine	OB/GYN*	Pediatrics**	Non-Primary Care Specialists	Unknown	Total
Total	**711**	**111**	**687**	**314**	**349**	**2,918**	**8**	**5,098**
Sex								
Male	575	100	535	241	187	2,523	5	4,166
Female	136	11	152	73	162	395	3	932
Race								
White	588	91	444	256	266	2,517	3	4,165
Black	87	13	104	44	35	129	0	412
Indian	2	1	5	1	4	15	1	29
Asian	28	6	95	6	37	181	2	355
Other	6	0	39	7	7	76	2	137
Age								
Under 30	9	0	21	3	6	24	2	65
30 - 34	61	4	101	39	49	223	4	481
35 - 39	111	3	118	39	60	372	0	703
40 - 44	86	3	124	42	59	431	0	745
45 - 49	105	6	109	52	48	468	1	789
50 - 54	111	17	88	35	39	405	1	696
55 - 59	68	14	49	33	35	356	0	555
60 - 64	53	13	23	29	21	266	0	405
65 - 69	27	12	19	15	16	173	0	262
≥70	80	39	35	27	16	200	0	397

*OB/GYN includes Gynecologic Oncology, Obstetrics, and Gynecology.

**Pediatrics includes Pediatrics, Pediatric Allergy, Pediatric Cardiology, Pediatric Critical Care Medicine, Pediatric Emergency Medicine, Pediatric Endocrinology, Pediatric Gastroenterology, Pediatric Hematology – Oncology, Pediatric Infectious Disease, Pediatric Intensive Care, Pediatric Nephrology, Pediatric Neurology, Pediatric Otolaryngology, Pediatric Pathology, Pediatric Psychiatry, Pediatric Pulmonology, Pediatric Radiology, Pediatric Rheumatology, and Pediatric Sports Medicine.

Source: Mississippi State Board of Medical Licensure

Map VI - 1
Active Primary Care Medical Doctors by County of Residence
License Year 2006



Includes: Family Practice, General Practice, Internal Medicine, Obstetrics and Gynecology and Pediatrics

Source: Mississippi State Board of Medical Licensure

101 Dentists

Numerically, dentistry represents the fourth largest health profession, following nursing, medicine, and pharmacy. The Mississippi State Board of Dental Examiners reported 1,407 licensed (1,212 “active” and 195 “inactive”) dentists in the state for 2006, with 44 new dentists licensed during 2005. Based on Mississippi's 2010 projected population of 2,975,551, the state has one active dentist for every 2,455 persons.

The more populated areas of Mississippi are sufficiently supplied with dentists; however, many rural areas still face tremendous shortages, particularly in dentists who specialize in treating periodontal disease. A statewide assessment of dental needs conducted in FY 2005 by the MDH Office of Primary Care determined that 62 counties could qualify as dental health professional shortage areas. Currently, 44 counties have been designated by the HRSA Office of Workforce Analysis and another 16 counties are awaiting approval.

Mississippi's two major population centers contain the most active dentists. The Jackson area had a total of 324 active dentists in 2005, with 174 in Hinds County, 75 in Rankin County, and 75 in Madison County. The Gulf Coast region had the second largest count at 148, with 82 in Harrison County, 56 in Jackson County, and ten in Hancock County. Combined, these two metropolitan areas contained 39 percent of the state's total supply of active dentists.

On the opposite end of the spectrum, seven counties – Carroll, Franklin, Greene, Kemper, Quitman, Tunica, and Webster – had only one active dentist each and six counties – Amite, Benton, Humphreys, Issaquena, Jefferson, and Sharkey – had no active dentist. Map VI-2 presents the number of dentists per county.

The University of Mississippi School Of Dentistry has awarded 792 Doctor of Dental Medicine degrees since graduating its first class in 1979, with 29 graduates in the school year 2004-2005. The School of Dentistry maintains 120 students overall, more or less equally divided among its four-year educational program.

The School of Dentistry accepts six residents each year in a general practice residency and six residents in an advanced education in general dentistry residency, for a total of 12 residents. Both residencies are one-year post-doctoral programs.

Nonwhite Dentists

A total of 68 non-white dentists have graduated from the UMC School of Dentistry, or 8.6 percent of its total graduates. The class of 2004-2005 included one non-white member.

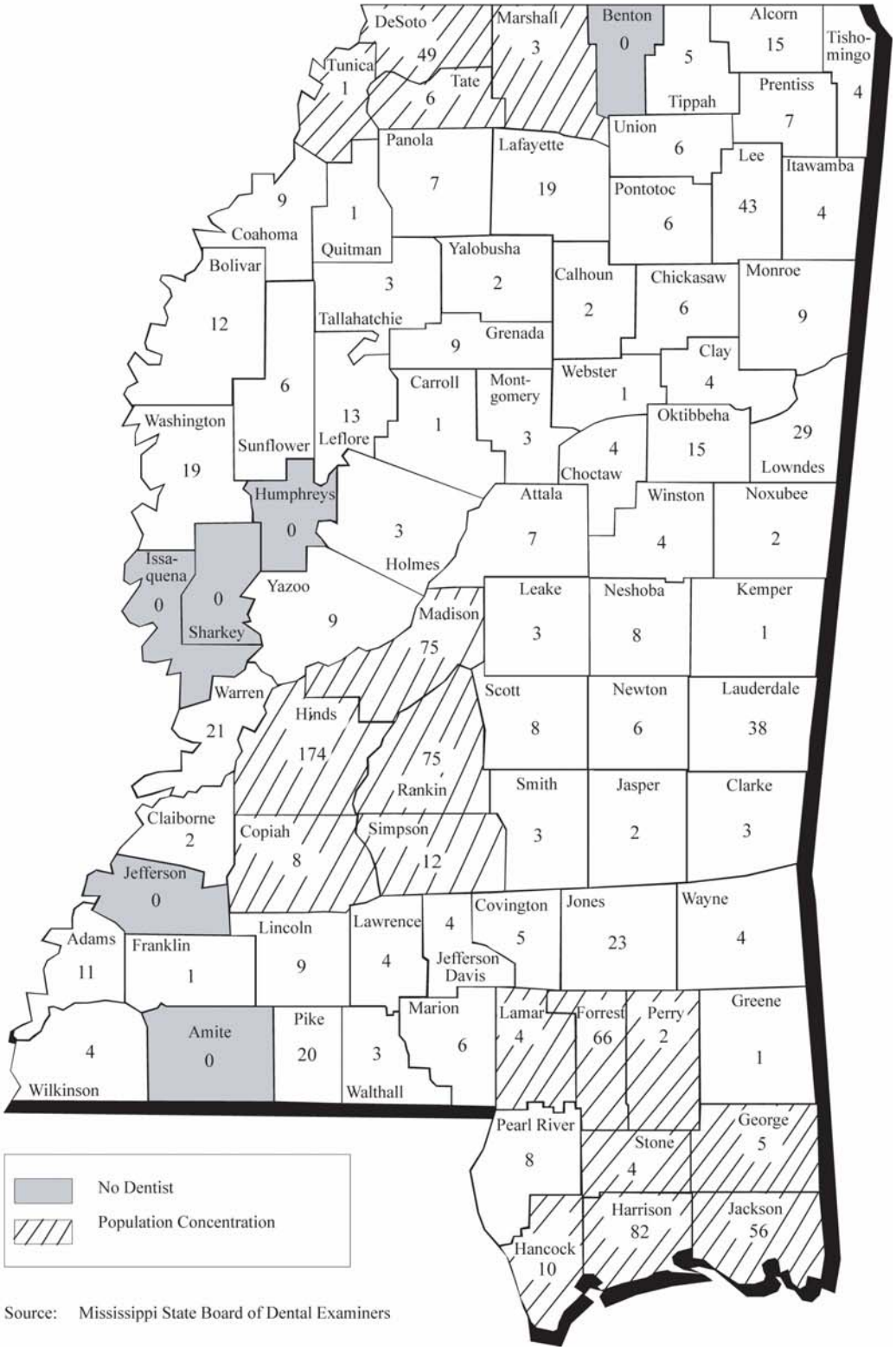
Dental Hygiene Personnel

Registered dental hygienists are licensed oral health care professionals whose preventive services limit the extent of cavities and periodontal (gum) disease. They provide oral health care to patients by scaling and polishing teeth; charting oral conditions; taking and processing x-rays; applying preventive topical fluorides and sealants; and providing advice and instruction concerning oral health. Dental hygienists work as clinical practitioners, educators, researchers, administrators, managers, preventive program developers, and consultants. Registered (licensed) dental hygienists practice according to the requirements of individual state dental practice acts.

Dental hygienists are the primary allied dental personnel in Mississippi. The Mississippi State Board of Dental Examiners reported 1,195 licensed dental hygienists (979 active and 216 inactive) in Mississippi in 2006, with 87 new licenses issued during 2005.

Mississippi has five schools of dental hygiene: the School of Health Related Professions at UMC in Jackson, Mississippi Delta Community College in Moorhead, Meridian Community College in Meridian, Northeast Mississippi Community College in Booneville, and the Forrest County Center of Pearl River Community College in Hattiesburg. The schools reported a total enrollment of 82 first-year students and 76 second-year students in 2005-2006. Seventy-eight students graduated in 2005.

Map VI - 2
Active Dentists by County
License Year 2006



Source: Mississippi State Board of Dental Examiners

102 Nurses

Members of the nursing profession represent the largest single contingent of professional health care providers in the state. In fact, nurses in Mississippi outnumber all other health professionals combined. The Mississippi Board of Nursing regulated 47,155 nurses in FY 2005. Of this number, 45,162 were licensed to practice along with an additional 392 practicing in this state under a privilege to practice pursuant to compact licensure in another state. (The statistics referenced by the Mississippi Board of Nursing in the remainder of this chapter do not include nurses practicing in Mississippi under the privilege to practice pursuant to compact licensure in another state). Inactive licensure was issued to 1,993 nurses.

Registered Nurses

The Board reported 33,750 registered nurses (RNs) in Mississippi for FY 2005. Of this number, 24,859 (73.7 percent) were employed full time in nursing careers; 3,974 (11.8 percent) were employed part-time in nursing careers; 682 (two percent) were employed in non-nursing careers; 2,868 (8.5 percent) were unemployed; and 1,367 (four percent) held inactive status. Of the 28,833 RNs employed full-time or part-time in nursing, 18,633 (64.6 percent) were employed in hospitals; 1,477 (5.1 percent) in nursing homes; 1,854 (6.4 percent) in physicians' offices; 2,482 (8.6 percent) in community, public, or home health; 648 (2.2 percent) in schools of nursing; 514 (1.8 percent) in schools; and 3,225 (11.2 percent) in other nursing careers. Of the total number of RNs, 91 percent were female and nine percent male; 84 percent were Caucasian, 14 percent African-American, and two percent other. Registered Nurses by degree in FY 2005 included 2,385 diploma; 17,551associates; 1,054 baccalaureate non-nursing; 9,506 baccalaureate nursing, 665 masters non-nursing; 2,364 masters nursing; and 225 doctorate degrees.

Nurse Practitioner

Nurse Practitioner includes any person licensed to practice nursing in Mississippi and certified by the Board of Nursing to practice in an expanded role as a nurse practitioner. For FY 2005, there were 1,599 RNs certified for expanded role nursing as nurse practitioners in the following specialties: Acute Care Nurse Practitioner - 36; Adult Nurse Practitioner - 41; Adult Psychiatric/Mental Health Nurse Practitioner - 18; Certified Nurse Midwife - 26; Certified Registered Nurse Anesthetist - 487; Family Nurse Practitioner - 877; Family Planning Nurse Practitioner - 3; Family Psychiatric/Mental Health Nurse Practitioner - 17; Gerontological Nurse Practitioner - 5; Neonatal Nurse Practitioner - 30; Obstetrics/Gynecology Nurse Practitioner - 11; Pediatric Nurse Practitioner - 23; and Women's Health Care Nurse Practitioner - 25.

Licensed Practical Nurses

The Board of Nursing reported 13,405 licensed practical nurses (LPNs) in Mississippi for FY 2005. Of this number, 8,997 (67.1 percent) were employed full-time in nursing careers; 1,428 (10.7 percent) were employed part-time in nursing careers; 353 (2.6 percent) were employed in non-nursing careers; 2,000 (14.91 percent) were unemployed; and 627 (4.7 percent) held inactive license.

Of the 10,425 LPNs employed full-time or part-time in nursing, 3,367 (32.3 percent) were employed in hospitals; 3,412 (32.7 percent) in nursing homes; 558 (5.4 percent) in community, public, or home health; 1,728 (16.6 percent) in physicians' offices; 343 (3.3 percent) in private duty; 73 (0.7 percent) in private industry; and 944 (9.1 percent) in other nursing careers. Of the total number of LPNs, 96 percent were female and four percent male; 64 percent Caucasian, 35 percent African-American, and one percent other.

There were 2,340 LPNs certified for an expanded role in FY 2005. Of this number, 2,185 LPNs were certified in an expanded role in intravenous therapy, 129 LPNs were certified in hemodialysis, and 26 were certified in both expanded roles.

Certified Nurse Aides/Assistants

The Department of Health's Bureau of Health Facility Licensure and Certification regulates the Nurse Aide Training and Competency Evaluation Programs. The Program certifies nurse aides to work in long-term care nursing facilities or distinct part/skilled nursing facilities in acute care hospitals that participate in the Medicare/Medicaid programs, as mandated by the Omnibus Budget Reconciliation Act of 1987. The Bureau develops requirements for approval of nurse aide training programs, conducts onsite inspections of nurse aide training programs, posts adverse findings against errant nurse aides in the Mississippi Nurse Aide Registry, and oversees the maintenance and content of the Registry.

As of December 31, 2005, Mississippi had 16,391 active Certified Nurse Aides on the Registry. A total of 2,244 nurses aides were certified during 2005. These numbers do not reflect the nurse aides that work in sites other than skilled nursing facilities and distinct part skilled nursing sections of certain rural hospitals. To be classified as a certified nurse aide, an individual must successfully complete a state approved nurse aide training program and pass a competency evaluation that includes written, oral, and clinical skill examinations.

Nursing Education

In the fall of 2005, the Mississippi Institutions of Higher Learning's nursing education programs enrolled 4,607 students, a 6.9 percent increase from the 2004 enrollment of 4,307. Mississippi has 23 undergraduate and six graduate nursing education programs, preparing a variety of professional nurse specialists for teaching fields, administration, or clinical practice. The University Medical Center and the University of Southern Mississippi collaboratively offer a Ph.D. degree in Nursing.

Undergraduate nursing education includes 16 associate degree programs, which are located in 14 community or junior colleges and two public universities. These programs enrolled a total of 3,026 students in Fall 2005 (66 percent of the 4,607 students involved in nursing school). Undergraduate education also includes seven baccalaureate degree programs in five public universities and two private colleges. A total of 1,221students participated in these programs for Fall 2005 (27 percent of all nursing students).

Mississippi offers six master's degree nursing programs in five public universities and one private college. These programs reported a total enrollment of 360 students in Fall 2005 (seven percent of all nursing students).

During FY 2005, 2,704 applicants were licensed as registered and licensed practical nurses by examination in Mississippi; 1,918 passed on the first attempt. In FY 2005, 1,950 Mississippi graduates of schools of nursing applied for licensure by examination through out the United States; 1,726, or 90 percent, passed the licensure examination on the first attempt.

103 Other Health Related Professionals

This section summarizes the status of health professional manpower in Mississippi in other specific categories.

Podiatrists

Foot care services are provided primarily by podiatrists, orthopedic surgeons, and general and family practice physicians. Podiatrists devote most of their practice to the treatment of soft tissue complaints and flat foot. Mississippi licensed 59 active, instate podiatrists for licensing year 2006. This number includes 43 general practitioners, 13 foot surgeons, two foot orthopedists, and one other or unknown. Age distribution included 15 aged 30-39, 27 aged 40-49, eight aged 50-59, and 10 aged 60 or over. Racial make-up was 37 white, 19 black, one Asian, and two of other race. Sex distribution was 45 males and 14 females.

Because most rural areas do not have a podiatrist, primary care physicians provide the majority of foot care. Under the formula for designation of podiatric care shortage areas, primary care physicians are estimated to spend two percent and orthopedic surgeons 15 percent of their time treating patients needing general foot care.

Chiropractors

The practice of chiropractic involves the analysis of any interference with normal nerve transmission and expression and the procedure preparatory and complementary to the correction thereof, by adjustment and/or manipulation of the articulations of the vertebral column and its immediate articulations for the restoration and maintenance of health without the use of drugs or surgery. Chiropractors are licensed to use x-rays and therapeutic modalities.

The Mississippi State Board of Chiropractic Examiners reported 265 chiropractors available to practice in the state during 2006. Chiropractors were located in 51 of Mississippi's 82 counties. The highest number of chiropractors was located in the following counties: 35 in Harrison; 22 in Hinds; 20 in Jackson; 17 in DeSoto; and 15 in Lee.

Psychiatrists and Psychologists

As reported in Table VI-1, 252 licensed physicians practiced psychiatry in Mississippi during FY 2005. The Jackson metropolitan area contained 45.2 percent of the psychiatrists, with 71 in Hinds County, 28 in Rankin, and 15 in Madison. Harrison County had 25 psychiatrists; Lauderdale County had 14; and Forrest County had 17.

The Mississippi Board of Psychology reported 384 licensed psychologists in the state for 2006. Only individuals with doctorate degrees are eligible for licensure in Mississippi. As with psychiatrists, the majority of psychologists practice in the Jackson area or on the Coast. Smaller concentrations practice in DeSoto, Forrest, and Lafayette counties, with the remainder scattered throughout the state. The actual number of licensed psychologists providing clinical services to the public is reduced when those filling administrative or teaching positions are subtracted from the total. A substantial portion of the state receives insufficient psychological services, particularly the rural areas.

Licensed Professional Counselors

The Mississippi State Board of Examiners for Licensed Professional Counselors, established in 1985, regulates the activities of individuals rendering services to the public under the title of "Licensed Professional Counselor" (LPC). Mississippi Licensed Professional Counselors are highly trained to do assessment, diagnosis, and treatment of mental disorders. They provide an array of services including psychotherapy; marriage and family therapy; vocational, educational, rehabilitation counseling; and consultation. They practice in both the private (170) and public sectors; in university (102) and school (118) settings; community mental health centers (196); state facilities (73); hospitals (76); and, other settings such as rehabilitation programs, churches, probation programs, correctional facilities and private industry (133) (Numerical counts as of April 2006).

The Board of Examiners for Licensed Professional Counselors reported 772 counselors in Mississippi in April 2006 and an additional 96 out-of-state residents with a Mississippi license. The Board granted 45 new licenses so far during the 2006 fiscal year. Currently, licensed professional counselors reside in approximately 90 percent of Mississippi counties.

Optometrists

The Mississippi State Board of Optometry reported 283 optometrists licensed in Mississippi for 2006, with 274 of those certified to use diagnostic and therapeutic agents. Effective July 1, 2005, Mississippi optometrists are authorized to prescribe oral medications in the treatment of ocular disease. Under new regulations requiring standardization of licensure, all optometrists will be certified to use diagnostic and therapeutic agents by December 2006. The Board conducts two licensure examinations each year, on the second Saturday of January and of July. Although every county does not have a resident optometrist, many optometrists operate branch offices in adjoining counties.

Pharmacists

The State Board of Pharmacy reported approximately 2,682 licensed pharmacists in the state during 2005, with an additional 958 pharmacists licensed in Mississippi but living in other states. The Board issued a total of 113 pharmacist licenses during 2005 – 65 issued by examination and 48 by reciprocity. The University of Mississippi School of Pharmacy, located on the Oxford campus, offers a six-year pharmacy program. The curriculum includes a minimum of two years of pre-professional and four years of professional studies. The school graduated 77 students in 2005 with a Doctor of Pharmacy degree.

Veterinarians

The Mississippi Board of Veterinary Medicine listed 986 licensed veterinarians in Mississippi in January 2006, with approximately 846 in full-time active practice, and 47 in part-time practice. The Board reports that no licensed veterinarians reside in Benton, Choctaw, Greene, Issaquena, Quitman, or Tunica counties, but these counties have adequate access to veterinary services from veterinarians residing in adjacent counties in Mississippi and neighboring states. Mississippi State University, College of Veterinary Medicine, has graduated 1,002 veterinarians since its first class in 1981. The College will accept 72 new candidates as of August 2006.

Physician Assistants

Physician Assistants (PA's) are educated in the medical model to provide diagnostic, therapeutic, and preventive health care services with physician supervision. Physician Assistants

work with physicians as part of a team in every medical and surgical specialty in every practice setting. Under the Physician Assistant Licensure Act, the State Board of Medical Licensure regulates the practice of PA's to include scope of practice, level of supervision, discipline, and other issues relevant to PA practice. PA's must pass a national certifying test and retest every six years. The Mississippi State Board of Medical Licensure issued 16 initial Physician Assistants licenses for licensing year 2006. Mississippi has a total of 67 physician assistants currently licensed in the state.

104 Allied Health Personnel

Allied health professionals render service in every aspect of health care delivery — emergency services, patient evaluation, treatment, therapy, testing, fabrication and fitting of medical devices, record maintenance, acute care, long-term care, and rehabilitation. This group of occupations exhibits wide variations in degree of responsibility, training, professional organization, regulation, employment settings, and characteristics of workers. Allied health personnel include technologists, therapists, and others who perform relatively high-level health care functions; technicians and assistants whose duties vary in complexity; and aides who perform routine supportive services. The scope of allied health education is similarly broad, ranging from limited post-secondary training to post-doctoral study.

For many occupations, responsibilities vary widely among employment settings and institutions. Other occupations are relatively new, and functions are still evolving. All of this diversity contributes to difficulty in developing reliable estimates of supply and demand for allied health personnel. This section discusses allied health occupations, training programs, and distribution throughout the state to the extent that information is available.

Physical Therapy Practitioners

Physical therapy (PT) practitioners provide preventive, diagnostic, and rehabilitative services to restore function or prevent disability from disease, trauma, injury, loss of a limb, or lack of use of a body part to individuals of all ages. Physical therapy practitioners also provide health care information to enhance function and to prevent disability and pain. Physical therapy is used to treat neurological disorders, nerve or muscular injuries, chest conditions, amputations, fractures, burns, arthritis, and many other conditions. Two categories of practitioners exist: physical therapist and physical therapist assistants.

In addition to treating and assessing the progress of patients, PT personnel work closely with other members of the health care team and instruct caregivers in treatment to be continued in the home. Practitioners provide services in hospitals, outpatient clinics, home health agencies, schools, and a variety of other settings. Practice patterns vary with employment settings.

A small number of Mississippi physical therapists have attained board-certified status in specific practice areas through advanced study/practice and successful completion of national certification examinations. Physical therapy assistants also have access to some specialty courses. Beginning July 2006, access to physical therapy services will be limited by insurance requirements and the licensure law that states that patients must be referred to physical therapy services for continued treatment by another health care provider, with some identified exceptions.

The Mississippi State Board of Physical Therapy reported 1,346 licensed physical therapists in Mississippi as of March 2006. Nine percent of the Mississippi resident physical therapy practitioners live in Hinds County, six percent in Harrison County, and eight percent in Madison County, for a total of 23 percent in three counties. Mississippi ranks 39th in the United States for the

ratio of therapists per 100,000 population. The Board also reported 569 licensed physical therapist assistants, with 446 practicing in the state.

UMC provides Mississippi's only three-year Doctor of Physical Therapy program. The physical therapy program has graduated 1,092 therapists since initiation of the program in 1973 and 36 will receive the final Master of Physical Therapy degrees in May 2006.

Hinds Community College, Itawamba Community College, Meridian Community College, and Pearl River Community College offer educational programs leading to associate degrees as a physical therapist assistant. In 2005 Itawamba graduated 12 PTAs, Pearl River seven, Hinds seven, and Meridian 12. Presently, there is a need to only maintain existing programs. The U.S. Department of Labor projects a 21-35 percent increase in employment through 2010. Demand for physical therapy practitioners should continue as the number of individuals with disabilities or limited functions increases due to an aging population and medical development.

Speech Pathologists and Audiologists

The disciplines of speech-language pathology and audiology focus on disorders in the production, reception, and perception of speech and language. Although both provide specialized assistance to persons with communication problems, speech-language pathologists are primarily concerned with speech, language, and voice disorders, while audiologists concentrate on hearing problems.

The MDH reported 960 speech-language pathologists and 144 audiologists licensed in Mississippi as of April 2006, with 875 of the speech-language pathologists and 125 of the audiologists residing in the state.

Occupational Therapists

Occupational therapy is a health and rehabilitation profession that serves people of all ages who are physically, psychologically, or developmentally disabled. These health professionals work closely with other members of the rehabilitation health care team. Their functions range from diagnosis to treatment, including the design and construction of various special and self-help devices. OTs direct their patients in activities designed to help them learn skills necessary to perform daily tasks, diminish or correct pathology, and promote and maintain health. There are two levels of personnel: occupational therapists and occupational therapy assistants.

Therapists work in many different settings, including rehabilitative and psychiatric hospitals, school systems, nursing homes, and home health agencies. The nature of their work varies according to the setting. There are a number of recognized specialty areas, which have national examinations and certification.

The MDH reported 727 licensed occupational therapists and 255 certified occupational therapy assistants on its Mississippi roster as of April 2006, with 594 of the OTs and 217 of the OTAs residing in the state.

The School of Health Related Professions at UMC offers the only school of occupational therapy in the state. It is a master's entry level that consists of a three-year senior college program, following two years of prerequisite course work at either a community college or a four-year senior college. Beginning in 2007, a master's degree or higher in occupational therapy will be the minimal educational requirement nationally. The first masters-level class at UMC will graduate in 2006. The school has graduated 356 therapists since beginning its first class in May 1989. The master's

program received more than 78 applications for a maximum of 40 available slots to begin class in the summer of 2006.

Pearl River Community College has developed an OTA program which expects to graduate 13 OTAs in May of 2006. Future classes are expected to contain a maximum of 20 students. Holmes Community College expects to graduate 14 OTA candidates in May 2006, and also has a maximum class size of 20 students. Also, Itawamba Community College initiated an Occupational Therapy Assistant/Pre-Occupational Therapy Program in the fall of 2006. The initial class will contain approximately 12 students.

The U.S. Department of Labor, Bureau of Statistics, *Occupational Outlook Handbook* projects that the occupational therapy profession will increase faster than average, especially as the rapid growth of the number of middle-aged and elder individuals increases the demand for therapeutic services. This growth is projected to have an increase of 27 percent or more in employment through 2014. As there is an expansion of the school-age population, there will also be an expansion of services for disabled students, resulting in an employment growth in the school systems.

Emergency Medical Personnel

The training of emergency medical personnel includes ambulance drivers and emergency medical technicians (EMTs). Mississippi requires all ambulance drivers to have EMS driver certification (EMS-D). To qualify, an individual must complete an approved driver training program that involves driving tasks, vehicle dynamics, vehicle preventative maintenance, driver perception, night driving, and information on different driving maneuvers. This training offers both academic and clinical (practical hands on) experiences for the prospective ambulance driver.

EMT training involves EMT-Basic (EMT-B), EMT-Intermediate (EMT-I), and EMT-Paramedic (EMT-P). In accordance with federal Department of Transportation standards, EMT-B training includes basic life support, airway, breathing, Automated External Defibrillators (AED), circulation procedures, and assistance to patients with a limited number of drugs.

The EMT-I and EMT-P receive training in basic and advanced life support, also in accordance with federal Department of Transportation standards. Advanced life support involves basic life support plus definitive therapy. The emergency physician, the EMT-I, and the EMT-P constitute the advanced life support team. This team assesses and aggressively treats life-threatening conditions using advanced airway maneuvers, invasive procedures, cardiac monitors, drugs, defibrillation, intravenous fluids, and other adjuncts.

The EMT-I performs the same basic responsibilities as an EMT-B. In addition, the EMT-I uses adjunctive equipment to sustain life, such as intravenous therapy, airway management, and defibrillation.

The EMT-P must master a variety of complex skills that are not practiced by the basic level emergency medical technician, such as intravenous cannulation, endotracheal intubation (airway management), recognition and management of cardiac dysrythmia, and administration of drugs and intravenous fluids. Many of these procedures can be very hazardous if performed by poorly trained persons; thus the paramedic must take responsibility for continuing competence and maintaining proficiency in those skills necessary to sustain life and prevent injury.

EMT personnel are certified for two year periods. For FY 2005 the MDH Bureau of Emergency Medical Services reported a total of 1,460 EMT Basics certified in the state; 1,096 EMT Paramedics; and 63 EMT intermediates.

The Legislature authorized the MDH Bureau of Emergency Medical Services (BEMS) to certify Mississippi's medical first responders beginning July 1, 2004. Since that time, BEMS has certified 86 medical first responders.

Social Workers

Social workers practice and serve as an integral part of a complex and multidisciplinary health care system. The field of social work provides a network of services to all age groups, with a range of needs, in the form of diagnosis, treatment, rehabilitation, maintenance, and prevention in a variety of settings, including hospitals, nursing homes, clinics, hospices, and public health programs.

The Mississippi State Board of Examiners for Social Workers and Marriage and Family Therapists reported 4,191 licensed social workers available during FY 2006, 3,732 of whom reside within the state. Three categories of licensure exist for social workers: Licensed Social Worker (LSW) for those individuals at the baccalaureate level, Licensed Masters Social Worker (LMSW) for those individuals who practice at the master's level, and Licensed Certified Social Worker (LCSW) for those individuals who have fulfilled the requirements for LMSW and completed a two-year requirement for post-master's professional supervision.

The Board reported 589 LCSWs, 683 LMSWs, and 2,460 LSWs available in Mississippi during FY 2006. The highest number of Master's level social workers reside in three counties: Hinds – 109 LCSW's, 120 LMSW's; Harrison – 80 LCSW's, 78 LMSW's; and, Forrest - 36 LCSW's, 63 LMSW's. Approximately 38 percent of LCSW's and 36% of LMSW's reside in these three counties. A maldistribution of master's level social workers often causes problems in some counties where no master's level social workers are available for the supervision of baccalaureate level social workers, as is required for reimbursement by most health care payors.

Finally, the State Board of Examiners for Social Workers and Marriage and Family Therapists recently assumed licensure of marriage and family therapists in 2005. There are 397 licensed marriage and family therapists, of which 341 reside in the state.

Certified Medical Technologists

The American Society of Clinical Pathologists (ASCP) is the major certifying agency for medical technologists in Mississippi. Candidates may also obtain certification through the National Credentialing Agency for Laboratory Personnel (NCA). The total number certified by these two agencies is unknown; however, UMC is currently performing a workforce study to determine the actual number of CLS/MTS and CLT/MLTs certified in Mississippi.

Mississippi has two university-based schools for clinical laboratory scientists/medical technologists and two hospital-based programs. The University of Mississippi Medical Center's (UMC) program resides in the Department of Clinical Laboratory Sciences and its graduates receive a bachelor of science degree in clinical laboratory sciences. Students complete two years of academic preparation at any accredited institution of higher learning and then two years of upper division study at the Medical Center campus in Jackson. The undergraduate program also offers an expanded curriculum that allows students to specialize in the areas of molecular diagnostics, laboratory information systems, or laboratory management. UMC also offers a masters and a doctorate degree in clinical health sciences, with a specialty track in clinical laboratory sciences. This program is

designed to prepare graduate level educators and managers for positions in universities and the clinical laboratory. The Department of Clinical Laboratory Science at UMC expects to graduate six senior students in May 2006. For the 2006-2007 academic year, UMC expects 20 junior and 14 senior students.

The University of Southern Mississippi (USM) offers a "modified two-plus-two program," in which students complete three years of study before entering the medical technology practicum. Students may complete the first two years of the curriculum at a community college or another senior college. The program has a process for articulation with accredited Medical Laboratory Technician (MLT) programs which provide career mobility for the associate degree-level technician. Once enrolled in the practicum, which is the senior year, students receive two semesters of study on the USM campus and then complete a 24-week clinical rotation at an affiliated hospital, which include Forrest General Hospital in Hattiesburg, Gulf Coast Medical Center in Biloxi, Memorial Hospital at Gulfport, and Singing River Hospital in Pascagoula. A Bachelor of Science (BS) degree is awarded upon completion of the program. The total number of majors is approximately 130 and 20 students have or will graduate in 2005-2006. The program experienced 100 percent placement for the last three years.

USM also offers two programs leading to the Master's degree in Medical Technology. One program is for individuals who possess certification as a medical technologist from a recognized national certifying agency, and the second program is for individuals who do not hold certification. The second program includes a medical technology practicum that allows the individual to become eligible to sit for a certification examination. Both the thesis and non-thesis options are available.

Mississippi's two hospital-based medical technology programs are located at North Mississippi Medical Center in Tupelo and Mississippi Baptist Medical Center in Jackson. In these programs, "three + one" students obtain three years of academic preparation at an institution of higher learning that has an affiliation agreement with the hospital program; then the students complete one year of clinical training in the respective hospital. These students receive a Bachelor of Science degree in medical technology from the university they attend. "Four + one" students complete a bachelor of science degree at any university, then complete one year of clinical training in the hospital with a certificate in medical technology. These programs graduated 12 students in 2005, expect to graduate 9 in 2006, and enroll 17 for the 2006-2007 term. Both programs experienced the lowest number of qualified medical technology applicants in 25 years.

Seven community colleges in the state offer two-year medical laboratory technician programs: Copiah-Lincoln, Gulf Coast, Hinds, Meridian, Mississippi Delta, Northeast, and Pearl River.

Certified Radiologic Technologists

Radiologic health services began with the diagnostic use of x-rays and the application of these and other forms of ionizing radiation for a limited number of therapeutic purposes. Now radiologic technology includes a wide variety of services ranging from diagnosis and therapy to radiation health and safety. New professions rapidly emerge as medical advances and technological developments introduce new equipment and instrumentation. Developments in ultrasound scanning, magnetic resonance imaging, and computerized tomography, including electronics, are revolutionizing the field.

The term "Radiologic Technology" actually encompasses all technologists specializing in radiography, nuclear medicine, radiation therapy, and diagnostic medical sonography. These technologists have national credentialing by the American Registry of Radiologic Technologists and

are affiliated with the American Society of Radiologic Technologists. As of April 2006, 2,753 credentialed technologists were registered with the Department of Health.

Mississippi has nine radiologic technology programs located at community colleges: Meridian, Copiah-Lincoln, Mississippi Delta, Gulf Coast, Itawamba, Jones, Northeast, Pearl River, and Hinds. The University of Mississippi Medical Center is the only certificate program in the state. Itawamba Community College established the state's first ultrasound program in 2000, and additional programs have been established at Hinds and Jones Community Colleges. UMC teaches a nuclear medicine program.

The Mississippi Society of Radiologic Technologists states that the job market for technologists does not indicate a shortage at this time, and current program enrollment in the state is meeting the needs of the job market. No expansion of existing programs or establishment of new programs is recommended. A baccalaureate program for a BS in Health Sciences has been established via UMC and the University of Mississippi, with a second campus in Tupelo. A radiation therapy program may be considered in the future. The need for qualified instructors, particularly program directors, faces a critical shortage nationwide, and should be a major concern for educational institutions in the state.

Registered Dietitians and Licensed Nutritionists

Nutrition professionals provide medical nutritional therapy for the treatment of disease, as well as providing education for the prevention of disease and disability. As of April 2006, the MDH Division of Professional Licensure reported 619 regular and 37 provisionally licensed dietitians.

Respiratory Care Practitioners

Respiratory care practitioners are graduates of technician or therapist programs and work under the direction of qualified physicians. Respiratory care is a health care specialty offering a set of unique challenges in prevention, diagnosis, treatment, management, and rehabilitation of people with lung problems. The majority of respiratory care practitioners work in hospitals, while others are employed in home health care, sleep clinics, pulmonary rehabilitation, and education.

The MDH reported 1,954 (28 held temporary licenses) respiratory care practitioners licensed in Mississippi as of April 2006, with 1,676 residing in the state. All Mississippi hospitals have licensed respiratory care practitioners on staff. Seven community colleges offer two-year programs in respiratory therapy: Copiah-Lincoln, Gulf Coast, Hinds, Itawamba, Meridian, Northeast, and Pearl River.

Health Information Managers

Health Information Managers use computer technology to collect, organize, analyze, and generate health data for treatment, reimbursement, planning, quality assessment, and research. These health information professionals help safeguard the accuracy and privacy of patient information, while guaranteeing patients' access to their own records. This profession evolved from medical record administration within a hospital setting to an occupation responsible for the identification and organization of healthcare data from multiple sources. Health information managers work in acute care, ambulatory, long-term and mental health care facilities, industrial clinics, state and federal health agencies, private industry, and colleges and universities.

The School of Health Related Professions at the University of Mississippi Medical Center offers the state's only two-year upper division baccalaureate degree program for health information

managers. Following graduation, the students are eligible to take the national registration exam and receive the credential RHIA, Registered Health Information Administrator. The RHIA is a manager and information specialist who interacts with other members of the medical, financial, and administrative staff to ensure that the information is protected, accurate, properly classified, and timely. RHIAs participate in the development and maintenance of health information systems.

Meridian, Hinds, and Itawamba Community Colleges offer two-year associate degree programs for the medical records technician. Students who satisfactorily complete these programs are eligible to take the examination for certification by the American Health Information Management Association and receive the credential RHIT, Registered Health Information Technician. RHITs perform a variety of technical health information functions, including evaluating health information, compiling health statistics, and coding diseases, operations, and procedures.

105 Health Manpower Standards

In planning for health manpower, one must consider the needs of current and projected populations for professional health services and the level of educational programs required to meet those needs. Unfortunately, significant numbers of professionals trained and educated in Mississippi leave the state, further increasing the difficulty of making accurate projections.

This section discusses standards and goals for the number of physicians, dentists, and nurses in Mississippi. The Department of Health recognizes that Mississippi needs additional health personnel in many fields; however, sufficient information is not available to estimate supply and demand for many professions, particularly allied health personnel.

Primary Care Physician Standard

The "National Guidelines for Health Planning" recommend a ratio of one primary care physician for every 2,000 persons. However, this ratio is a minimum number because it does not reflect the productivity of individual physicians nor the availability of physicians to all population groups. The U.S. Department of Health and Human Services requires a ratio of 3,500 persons per primary care physician to designate an area as a health professional shortage area for primary care. The Department will also designate areas with 3,000 persons per primary care physician if the area meets certain other conditions, as discussed at the beginning of this chapter. Mississippi had 75 counties or portions of counties designated as health professional shortage areas in July 2006.

Although the state as a whole has a ratio of one primary care physician per 1,370 persons based on 2010 projected population, the physicians are maldistributed. Almost 60 percent (1,257) of the 2,172 primary care physicians lived and practiced in only nine counties; Hinds County alone had 23.8 percent of the total. The Department of Health recommends a ratio of one primary care physician for every 2,000 people as a goal for every county not currently meeting this standard.

Dentist Standard

The U.S. Department of Health and Human Services requires a ratio of 5,000 persons per dentist to designate an area as a health professional shortage area for dental care. This ratio is also the Mississippi standard. Based on a 2010 projected population of 2,975,551, the state currently has one active dentist for every 2,455 persons; however, as with physicians, the dentists are maldistributed through the state. Approximately 39 percent of Mississippi's dentists practice in the two metropolitan areas: Jackson and the Gulf Coast. Other counties have few dentists or none at all. The state's goal is to improve the distribution so that no county has more than 5,000 persons per dentist and primary dental care is available within 30 minutes travel time of all areas.

Nursing Standard

Based on the 2010 projected population, Mississippi currently has one registered nurse employed full-time in a nursing career for every 120 persons, and one licensed practical nurse employed full-time in a nursing career for every 331 persons. The role of the nurse continues to expand, and nurses sometimes provide health care in rural areas which do not have access to physicians. The state supports the diverse nursing education programs throughout Mississippi and recognizes the importance of the nurse's role as a provider of quality and economical health care in a variety of health care areas.

106 Strategies for Meeting Health Manpower Shortages

In attempting to recommend or suggest health system changes necessary to reach established manpower standards, one must remember that several variables have unpredictable effects. The recommendations presented here are based upon the judgment, experience, and current knowledge of the planning staff.

Physicians

Mississippi meets the minimum national standard statewide, but does not meet the standard in every county. The following recommendations would help the state improve its primary care physician to population ratio in underserved counties:

1. Increased retention of Mississippi graduates who go out of the state for primary care residency training.

2. Increased primary care residency opportunity within the state through expansion of the federally funded Area Health Education Center (AHEC) program established by the University of Mississippi Medical Center. AHEC provides off-site educational experiences in local communities for students and medical residents. Medical students and residents who receive a portion of their training in rural communities are more likely to return to those areas upon completion of training.

3. Continuation of the Family Medical Education Scholarship program begun in 2001. This scholarship provides up to the cost of attendance as defined by the Office of Student Financial Aid at the University of Mississippi Medical Center (UMMC). Funds permitting, the program will award scholarships up to 20 medical students who attend UMMC and who commit to practice family medicine in a medically underserved area of Mississippi that is designated a "critical needs" area for six years upon completion of medical training. Currently, five UMMC students participate in the program.

4. Provision of a 10 percent bonus under the Medicaid program for primary care physicians practicing in Health Professional Shortage Areas (HPSAs). The federal Medicare program currently awards a 10 percent reimbursement bonus to physicians who practice in HPSAs to recognize the reduced earning capacity associated with practicing in a rural area and the need to attract additional physicians to these areas. Extending this bonus to primary care physician payments under the Medicaid program would serve as an increased incentive to attract needed doctors to underserved areas of the state.

Dentists

As with physicians, the state as a whole meets the minimum national standard for dentists, but many counties do not. Changes recommended to help achieve this goal in the provision of dental care are as follows:

1. An incentive program to encourage dentists to settle in rural areas where access to dental care is limited.

2. An innovative financial aid package for financially disadvantaged and/or minority applicants that is competitive with financial aid packages offered throughout the southeastern United States. The Omnibus Loan or Scholarship Act of 1991 created a program of scholarship aid for dentists as well as physicians, but funding has been inadequate to achieve substantial results.

Nurses

The Mississippi Nursing Organization Liaison Committee (NOLC), a committee of the Mississippi Nurses Association composed of representation from 25 nursing organizations, has worked proactively to address nursing workforce issues related to anticipated changes in nursing and the health care delivery system. Through the efforts of the NOLC, the Mississippi Legislature passed the Nursing Workforce Redevelopment Act during the 1996 Session. The Act authorized the Mississippi Board of Nursing to establish an entity that would be responsible for addressing changes impacting the nursing workforce.

In 1996, the NOLC also received a three-year Robert Wood Johnson Foundation (RWJF) *Colleagues in Caring* grant entitled ***Mississippi Nursing Workforce 2000.*** The grant's objectives were closely aligned with the efforts of the Nursing Workforce Redevelopment Act. Maximum effectiveness was obtained through the combination of the funds, goals and objectives, advisory boards, and staff of the two projects. The effort resulted in the formation of the Office of Nursing Workforce Redevelopment (ONWR) with several objectives, including: (1) the development and implementation of a systematic annual survey for nursing manpower needs and projections and (2) the development of a competency model to assist students in articulation and mobility within the multi-level nursing education system.

In March 1999, the ONWR received an additional three-year grant from the Robert Wood

Johnson Foundation as one of 20 participants in Stage II of the *Colleagues in Caring* grant initiative. In 2001, with endorsement from NOLC and spearheaded by the Mississippi Nurses Association (MNA), an amendment to the original legislative act was passed. This amendment changed the name to the Office of Nursing Workforce (ONW) and authorized ONW to establish systems to ensure an adequate supply of nurses to meet the health care needs of the citizens of Mississippi. Additionally, the office received $100,000 from the Legislature. ONW's commitment to designing policy strategies and leadership development will assist in positioning Mississippi as one of the states leading the effort to proactively address nursing workforce issues through policy and planning.

Currently, with funding from the legislature and the Mississippi Development Authority, ONW is working with the Mississippi Council of Deans and Directors of Schools of Nursing, the Mississippi Nurses Association and the Mississippi Organization of Nurse Executives to address issues vital to nursing. These issues include faculty shortages, barriers to nursing education, recruitment into nursing, scholarship funding, the image of nursing, service/education collaboratives, retention of nursing service employees, and leadership training for nurses. More information is available by calling ONW or visiting www.monw.org.

The Mississippi Educational Mobility Effort

Working with a consultant and the Office of Nursing Workforce Redevelopment, the Mississippi Council of Deans and Directors of Schools of Nursing (the Council) developed and approved the *Mississippi Competency Model* (the Model) for testing. The document clearly defined major nursing roles and the competencies within each role. Competencies for all levels of nursing education in the state were identified, including those for licensed practical nursing (LPN), associate degree nursing (ADN), baccalaureate degree nursing (BSN), and master of science in nursing (MSN) programs. The Model served to identify the uniqueness of each level of nursing preparation as it related to expected competencies and will assist health planners to more clearly understand the various curricula offered within Mississippi's nursing education system to facilitate educational mobility.

Because there were no doctoral programs in Mississippi during the original Model development, Ph.D. competencies were not included. Since that time, the University of Mississippi Medical Center School of Nursing in Jackson and University of Southern Mississippi School of Nursing in Hattiesburg have developed programs leading to a Ph.D. in Nursing. A Task Force on Doctoral Competencies was established in 2001 to facilitate the development of the doctoral competencies. The revised model is now known as the Mississippi Nursing Competency Model and can be accessed via the Internet at www.monw.org.

Nursing Workforce Requirements

The determination of nursing workforce needs requires strategic synthesis of data concerning the supply of and demand for nurses. Currently, nurse supply data are available from the Mississippi Board of Nursing. To determine the demand for nurses, the MDH Division of Licensure and Certification added a survey to existing agency licensure renewal application forms mailed to acute care hospitals, long-term care facilities, and home health agencies. Employers were asked to report their 2004 or 2005 budgeted full-time equivalent (FTE) positions and vacancies for multiple categories of Registered Nurses (RNs), for Licensed Practical Nurses (LPNs), and for ancillary personnel. Additionally, employers were asked to project the number of FTEs they *intend* to have in the following two years for each of the personnel categories. Responses were returned to the Office of Nursing Workforce for analysis. Surveys were received from 93 hospitals and 186 aging and adult service facilities. Respondents for hospitals and aging and adult service facilities were well distributed throughout the state (Table VI-3).

Table VI-3

Number and Percent of Hospital and Aging and Adult Service Employers Responding by Public Health District

Public Health District	Counties Included	Hospital		Aging and Adult Services	
		N	%	N	%
I	Coahoma, DeSoto, Grenada, Panola, Quitman, Tunica, Tate, Tallahatchie, Yalobusha	6	6.5	12	6.5
II	Alcorn, Benton, Itawamba, Lafayette, Lee, Marshall, Pontotoc, Prentiss, Tippah, Tishomingo, Union	10	10.8	28	15.1
III	Attala, Bolivar, Carroll, Holmes, Humphreys, Leflore, Montgomery, Sunflower, Washington	10	10.8	19	10.2
IV	Calhoun, Chickasaw, Choctaw, Clay, Lowndes, Monroe, Noxubee, Oktibbeha, Webster, Winston	12	12.9	17	9.1
V	Claiborne, Copiah, Hinds, Issaquena, Madison, Rankin, Sharkey, Simpson, Warren, Yazoo	17	18.3	42	22.6
VI	Clarke, Jasper, Kemper, Lauderdale, Leake, Neshoba, Newton, Scott, Smith	14	15.1	18	9.7
VII	Adams, Amite, Franklin, Jefferson, Lawrence, Lincoln, Pike, Walthall, Wilkinson	9	9.7	17	9.1
VIII	Covington, Forrest, Greene, Jefferson Davis, Jones, Lamar, Marion, Perry, Wayne	10	10.8	18	9.7
IX	George, Hancock, Harrison, Jackson, Pearl River, Stone	5	5.4	15	8.1
Total	All Counties	93	100.0	186	100.0

Source: Office of Nursing Workforce

Demand for Nursing Personnel in Hospitals

Registered Nurses (RNs). The 93 responding hospital employers reported a total of 12,085 budgeted FTEs for 2005. The RN FTEs include all RNs in a variety of roles in addition to staff nurses. These roles include administration, patient and inservice education, quality improvement, infection control, advanced practice nurses (nurse practitioner, clinical nurse specialist, nurse-midwife, and nurse anesthetist), and other roles. Of the total number of budgeted RN FTEs, 951.4 were vacant, resulting in a vacancy rate of 7.9 percent, slightly higher than last year's 7.7 percent.

Among employers reporting total RN FTEs, 85 provided data for 2005 budgeted FTEs and the total number of RN FTEs they intend to budget in 2006 and 2007. The current and intended numbers of RN FTEs reported by these employers are: 9,539 in 2005; 9,821 in 2006; and 9,992 in 2007. The intended increase of 453 budgeted RN FTEs represents an overall 4.7 percent increase in budgeted RN FTEs over the three-year period.

A total of 83 employers provided data on the educational level of RN employees in 2005. The greatest percentage of RNs in hospitals hold the associate degree. The percent of RNs employed by hospitals at each educational level in 2005 were: diploma, 3.0 percent; associate degree, 62.0 percent; baccalaureate degree, 29.9 percent; master's degree 5.0 percent; and doctorate, 0.1 percent.

Budgeted 2005 FTEs and vacancy rates were reported for specific categories of RN personnel. For RN staff nurse FTEs, hospital employers reported a 7.9 percent vacancy rate (N=93). Employers reported a 6.5 percent vacancy rate (N=91) for RNs in administrative positions. Employers reported a 7.1 percent vacancy rate (N=71) for RNs in infection control roles, a 7.4 percent vacancy rate (N=66) for inservice educators, a 1.7 percent vacancy rate (N=62) for RNs in quality improvement roles, a 3.9 percent vacancy rate (N=51) for case managers, a 1.8 percent vacancy rate (N= 31) for RNs in patient educator roles, a 6.8 percent vacancy rate (N=14) for RNs in first assistant roles, and a 7.8 percent vacancy rate (N=13) for clinical nurse specialists.

The actual numbers of personnel listed by employers in some categories were too small for further analysis. Budgeted 2005 FTEs as well as intended FTEs for 2006 and 2007 for selected specific categories of RNs employed in hospitals are shown in Table VI-4. Since not all hospitals employ or intend to employ all categories of RN personnel, there are differing numbers of employers responding.

Most RNs working in hospitals are identified as staff nurses (87.6 percent). Among employers providing FTE data across all three time periods, there is moderate intention to increase the number of budgeted RN staff nurse FTEs between 2005 and 2007. Other growth areas appear to be in the specific RN categories of infection control, inservice educators, family nurse practitioners, and certified registered nurse anesthetists. There is minimal intention to increase the number of budgeted FTEs in other categories.

Table VI-4

Personnel Categories, Number of Hospital Employers Providing FTE Data Across All Three Time Periods and the Percent Change for Selected Categories of RN Personnel

RN Personnel Category	Number of Employers	2005 Budgeted FTEs	2006 Intended FTEs	2007 Intended FTEs	Change in FTEs	Percent Change
RN Staff	85	8,305	8,283	8,422	117	1.4
Administrator	84	735	746	760	25	3.4
Case Manager	45	N/A	N/A	N/A	N/A	N/A
Quality Improvement	56	106	106	106	0	0.0
Clinical Nurse Specialist (CNS)	10	57	62	68	11	19.3
Infection Control	64	61	64	64	3	4.9
Inservice Educator	58	112	115	116	4	3.6
Patient Educator	26	44	45	45	1	2.3
First Assistant	11	22	23	23	1	4.5
Family Nurse Practitioner	44	167	169	171	4	2.4
Acute Care NP	12	20	25	26	6	30.0
Certified Registered Nurse Anesthetist (CRNA)	37	174	185	191	17	9.8

Source: Office of Nursing Workforce

Approximately 73 percent of the employers, a slight increase over last year, indicated they had difficulty recruiting one or more categories of RNs in 2005. Areas of need listed most frequently were: medical/surgical units, critical care areas, emergency room, psychiatric, and geriatric psychiatric units. Twenty-five hospitals reported the use of a total of 225 RNs licensed under the compact licensing agreement.

Employers had the opportunity of listing nursing continuing education needs for their hospitals. The primary continuing education needs cited were ACLS/PALS/ATLS/trauma care, patient safety, medications, critical thinking, documentation (particularly legal aspects), regulatory issues and standards, leadership/management skills.

Licensed Practical Nurses (LPNs). Eighty-five employers provided vacancy and total budgeted LPN FTEs in 2005. Respondents reported 2,160 budgeted LPN FTEs and 261 FTE vacancies, resulting in an LPN vacancy rate of 12.1 percent, slightly higher than last year's rate of 11.6 percent. Sixteen hospital employers (17 percent) indicated they had difficulty recruiting LPNs in 2005.

LPN FTEs were reported for 2005, 2006, and 2007 by 76 employers. The current and intended number of LPN FTEs was reported as: 1,670 in 2005; 1,704 in 2006; and 1,737 in 2006. The intended increase of 67 budgeted LPN FTEs represents an overall 3.9 percent increase in LPN FTEs over the three-year period, a decrease from last year's predicted increase of 5.9 percent.

Ancillary Personnel. Ancillary personnel vacancy and total budgeted FTEs for 2005 were reported by 86 employers. There were a total of 5,300 budgeted ancillary personnel FTEs and 438 FTE vacancies, resulting in a vacancy rate of 8.3 percent for ancillary personnel, slightly higher than last year.

A total of 77 hospital employers reported budgeted FTE data for ancillary personnel for 2005, 2006, and 2007. The current and intended numbers of ancillary personnel FTEs are: 4,213 in 2005; 4,278 in 2006; and 4,314 in 2007. The intended increase of 272 budgeted FTEs represents an overall 2.4 percent increase in ancillary personnel FTEs over the three-year period, less than half of the 5.8 increase predicted last year.

Temporary Personnel. Employers were asked whether they used temporary help to staff their facilities. The majority of employers (N= 57, 61 percent) indicated they do not use temporary help. Of the 36 hospitals reporting the use of temporary nursing service staff, 30 (83.3 percent) used 8.2 percent or less. Eighty-two (88 percent) employers indicated they used part-time staff. Of the 82 hospitals reporting use of part-time personnel, 53 (65 percent) used 20 percent or less. The number of hospitals reporting the use of temporary personnel decreased and the number reporting use of part-time personnel increased from 2004 to 2005.

Demand for Nursing Personnel in Aging and Adult Services

Registered Nurses (RNs). The 186 responding employers reported a total of 1,442 budgeted RN FTEs for 2006. The RN FTEs include all RNs in a variety of roles in addition to staff nurses including administration, quality improvement, inservice education, advanced practice (nurse practitioners, clinical nurse specialist), and other roles. Of the total number of budgeted RN FTEs, 185.5 were vacant resulting in a vacancy rate of 12.9 percent, slightly higher than last year's vacancy rate. Fifteen facilities reported the use of a total of 45 RNs licensed under the licensing compact agreement.

Among employers reporting total RN FTEs, 182 provided data for 2006 budgeted FTEs and the total number of RN FTEs they intend to budget in 2007 and 2008. The current and intended numbers of RN FTEs reported by these employers are: 1,423 in 2006; 1,495 in 2007; and 1,577 in 2008. The intended increase of 154 budgeted RN FTEs represents an increase of 10.8 percent in budgeted RN FTEs over the three-year period, substantially higher than last year's predicted increase of 3.2 percent.

A total of 183 employers provided data on the educational level of RN employees in 2006. The greatest percentage of RNs in aging and adult services hold the associate degree. The percentage of RNs employed at each educational level in 2006 were: diploma, 5.6 percent; associate degree, 76.1 percent; baccalaureate degree, 15.7 percent; master's degree, 2.5 percent; and doctoral degree, 0.1 percent. A total of 166 employers reported their intention to increase RNs by educational level through 2008. There is no intent to increase diploma, masters, or doctoral prepared RNs. There is intent to increase associate degree nurses by 7.9 percent and baccalaureate nurses by 12.6 percent.

Budgeted 2006 FTEs and vacancy rates were reported for specific categories of RN personnel. For RN staff nurse FTEs, employers reported a 14.5 percent vacancy rate. Aging and adult services employers reported a 9.5 percent vacancy rate for RNs in administrative positions. Reported vacancy rates were 14.3 percent for quality improvement FTEs and 16.2 percent for inservice educator FTEs. Budgeted 2006 FTEs, as well as intended FTEs for 2007 and 2008 for selected specific categories of RNs employed in aging and adult services are shown in Table VI-5. Since not all aging and adult services agencies employ or intend to employ all categories of RN personnel, there are differing numbers of employers responding.

Table VI-5
Personnel Categories, Number of Aging and Adult Services Employers Providing FTE Data Across All Three Time Periods, And the Percent Change for Selected Categories of RN Personnel

RN Personnel Category	Number of Employers	2006 Budgeted FTEs	2007 Intended FTEs	2008 Intended FTEs	Change in FTEs	Percent Change
Staff	167	765	823	837	72	9.4
Administrator	169	377	379	381	4	1.1
Quality Improvement	81	98	102	103	5	5.1
Inservice Educator	73	66	69	71	5	7.6
Other RN's	56	105	107	107	2	1.9

Source: Office of Nursing Workforce

The majority of RNs working in aging and adult services are identified by employers as staff nurses (54 percent). Among employers providing FTE data across all three time periods, there is intention to increase the number of budgeted RN staff nurse, administrative, quality improvement, and inservice education FTEs between 2006 and 2008. Several other categories of RN personnel were listed for employer responses. However, the actual number of personnel listed by employers in these categories is too small for further analysis. These categories include clinical nurse specialists and nurse practitioners. Eight facilities reported use of clinical nurse specialists and ten reported use, or intended use, of nurse practitioners. Fifty-six employers indicated they used RNs in roles other than those listed, such as MDS coordinators, case management, care plan coordinators, and assessment coordinator.

Recruitment difficulties were reported by 144 facilities (77.4 percent). Eighty (43 percent) of aging and adult services employers indicated they had difficulty recruiting RNs in 2006. Employers had the opportunity of listing nursing continuing education needs for their facilities. Again, documentation was most frequently listed as a continuing education need, followed by leadership/management/supervisory skills, wound care, regulatory and legal issues, and medication administration.

Licensed Practical Nurses (LPNs). Vacancy and total budgeted LPN FTEs for 2006 were reported by 186 aging and adult services employers. Respondents reported 2,654 budgeted LPN FTEs and 333 FTE vacancies, resulting in an LPN vacancy rate of 12.6 percent and representing little change over last year's vacancy rate of 12.5 percent. Of those 186 employers providing data for 2006, a total of 106 (57 percent) indicated difficulty recruiting LPNs in 2006. Twenty-four facilities reported the use of a total of 122 LPNs licensed under the compact licensing agreement.

LPN FTEs were reported for 2006, 2007, and 2008 by 183 employers. The current and intended numbers of LPN FTEs are: 2,619 in 2006; 2,737 in 2007; and 2,756 in 2008. The intended increase of 137 budgeted LPN FTEs represents an overall 5.2 percent increase in budgeted LPN FTEs over the three-year period.

Ancillary Personnel. Ancillary personnel vacancy rate and total budgeted FTEs for 2006 were reported for 178 aging and adult services employers. A total of 7,635 ancillary personnel

FTEs and 615 FTE vacancies were reported, resulting in a vacancy rate of 8.0 percent for ancillary personnel. Sixty (32 percent) of the employers indicated difficulty recruiting ancillary personnel. The percentage of employers indicating difficulty recruiting certified nursing assistants has almost doubled in the past year.

A total of 174 aging and adult services employers reported budgeted FTE data for ancillary personnel for 2006, 2007, and 2008. The current and intended numbers of ancillary personnel FTEs are: 7,524 in 2006; 7,737 in 2007; and 7,719 in 2008. The intended increase of 195 budgeted FTEs represents an overall 2.6 percent increase in budgeted ancillary personnel FTEs over the three-year period.

Temporary Personnel. A total of 80 aging and adult services employers (43.0 percent) indicated they use temporary nursing personnel. Of the 71 employers indicating a percent of temporary help, the majority indicated use of 20 percent or less for their nursing personnel requirements. Use of part-time staff was reported by 150 (80.6 percent) of facilities. The majority of those facilities use 20 percent or less. Only two (1.1 percent) indicated use of foreign trained nurses.

School of Nursing Data

Data for the following section were extracted from annual 2006 surveys administered to the Deans and Directors of Schools of Nursing by the Southern Regional Education Board (SREB) Council on Collegiate Education for Nursing and the Mississippi Office of Nursing Workforce. Permission to use the data was granted by SREB and the Mississippi Council of Deans and Directors of Schools of Nursing.

Currently, there are 21 state accredited Mississippi Schools of Nursing, including 7 baccalaureate degree programs and 16 associate degree programs. Twenty-one (100 percent) schools participated in the survey:

1. Alcorn State University
2. Coahoma Community College
3. Copiah-Lincoln Community College
4. Delta State University
5. East Central Community College
6. Hinds Community College
7. Holmes Community College
8. Itawamba Community College
9. Jones County Community College
10. Meridian Community College
11. Mississippi College
12. Mississippi Delta Community College
13. Mississippi Gulf Coast Community College
14. Mississippi University for Women
15. Northeast Mississippi Community College
16. Northwest Mississippi Community College
17. Pearl River Community College
18. Southwest Mississippi Community College
19. University of Mississippi Medical Center
20. University of Southern Mississippi
21. William Carey College

Respondents reported that not every student admitted to associate, baccalaureate, masters, and doctoral programs subsequently enrolled. Additionally, all programs, other than doctoral, reported having qualified students who were not admitted. Eleven of the fourteen associate degree programs could not have accepted more students. Six of the seven baccalaureate programs could not have accepted more students. Four of the six masters programs could have accepted more students.

Both Associate and Baccalaureate programs listed (1) lack of faculty to teach students, (2) lack of campus resources, e.g., classroom/lab space and (3) limited clinical sites for interactive learning experiences as the top three factors preventing acceptance of more students in the program. Masters programs cited lack of qualified applicants and lack of faculty to teach students as the most common factors that prevented acceptance of more students.

The total number of full-time and part-time students reported by participating schools is 5,188 (see Table VI-6). Of those students, 1,811 are expected to graduate by August 2006. Approximately 20.1 percent (1,041) of students currently enrolled in participating programs are male (a seven percent increase as compared to last year) and the majority are Caucasian (see Table VI-6).

Table VI-6
Nursing Student Status and Gender

Program Type	Full-Time		Part-Time		Total	Male*	Female*	Expect to Graduate August 06
ADN	3,478	98.6%	49	1.4%	3,527	782	2,656	1,130
BSN	1,148	93.0%	86	7.0%	1,234	217	1,017	496
MSN	250	64.1%	140	35.9%	390	36	354	175
PHD	21	56.8%	16	43.2%	37	6	31	10
Total	4,897	N/A	291	N/A	5,188	1,041	4,058	1,811

*89 (1.7 %) students not identified by gender.
Source: Office of Nursing Workforce

Table VI-7
Number of Students by Ethnic/Racial Group*

Program Type	African American	American Indian / Alaskan Native	Asian	Caucasian (non-Hispanic)	Hispanic	Other
ADN	721	6	27	2,647	30	7
BSN	277	4	14	924	9	6
MSN	100	0	3	283	4	0
PHD	8	0	0	28	0	1
Total*	1,106	10	44	3,882	43	14
Percent	21.3%	0.2%	0.8%	74.8%	0.8%	0.3%

* 89 (1.7%) students not identified in ethnic/racial groups.
Source: Office of Nursing Workforce

Participants reported 459 budgeted full time positions in the nursing education units; 40 (8.7 percent) were unfilled. Twenty-five nurse educators resigned during the 2005-2006 academic year for various reasons. The primary reasons for resignation were salary and relocation due to Hurricane Katrina. Thirteen nurse educators are expected to resign during the 2006-2007 academic year.

Ten nurse educators retired during the 2005-2006 academic year, with 15 retirements projected for the 2006-2007 academic year, 23 retirements predicted for the 2007-2008 academic year, and 37 retirements predicted for the 2008-2009 academic year. Ninety percent of the nurse educators who retired during the 2005-2006 academic year were in the 56 to 65 age group. Eighty-five retirements and 38 resignations through the 2008-2009 academic year in conjunction with the 40 unfilled nurse educator positions would result in a vacancy rate of 35.5 percent (163) in three years. This vacancy rate is approximately 10 percent higher than last year's predicted rate. Sixty 2006 graduates of masters and doctoral programs are expected to complete courses to teach nursing.

This year, the MS Board of Nursing, the MS Nurses Association, the MS Office of Nursing Workforce, the MS Council of Deans and Directors of Schools of Nursing, and the MS Hospital Association have worked collaboratively to address faculty shortage issues. The most frequently cited reason for nurse educator resignation was salary. Many reported the ability to earn higher salaries in clinical practice or in nursing education in other states. Legislation aimed at improving nursing faculty salaries in schools of nursing was introduced and passed. Additionally, the MS Hospital Association commissioned a white paper, which will be available later this year, to address the faculty shortage. The aforementioned group is committed to providing adequate numbers of nurses to care for Mississippians. To this end, the information gathered for the white paper and the forthcoming recommendations will be used to strategically plan for nursing faculty losses and to provide additional faculty for increasing capacity.

Occupational Therapists

To maintain the number of occupational therapists and occupational therapy assistants in the state, the following strategies are recommended:

I. Encourage the maintenance of the occupational therapy educational system.

   A. Support existing educational programs for occupational therapy assistants in Pearl River and Holmes Community Colleges. Due to the fluctuating marketplace, expansion and development of future programs is unadvisable at this time.

   B. Promote the development and funding of the existing program providing occupational therapy education, both clinically and didactically.

   C. Increase the number of qualified applicants from the high school level through college years.

II. Continue to recruit qualified applicants into occupational therapy education programs, from high school level forward.

   A. Target specific promotion to additional populations, including second career seekers, underemployed persons in related fields, and baccalaureate degree graduates in related fields.

   B. Mount efforts aimed at attracting and retaining minorities in the profession.

C. Encourage the continued recruitment of qualified applicants from the high school level through college years.

III. Increase promotional activities aimed at expanding the availability of occupational therapy services to meet the needs of unserved or underserved persons. Support research to produce valid information of the efficacy of occupational therapy treatment for use in promoting the development of this service.

IV. Offer incentives such as day care, competitive salaries, and financial support for continuing education to attract other occupational therapists to the state.

Physical Therapists

To maintain the number of physical therapists and physical therapist assistants in the state, the following strategies are recommended:

I. Encourage maintenance of the physical therapy educational system.

A. Promote expansion and adequate funding of the existing physical therapy educational opportunities in the state, including clinical education components as well as didactic education. Also increase the numbers of qualified physical therapy faculty.

B. Support maintenance of the physical therapy educational program at the University Medical Center.

C. Provide financial aid to physical therapy students, especially those who are financially disadvantaged and/or minorities to encourage them to remain in the state as a practitioner.

II. Promote activities aimed at providing physical therapy services to persons presently unserved or underserved.

III. Encourage research to enhance evidence based practice.

IV. Support existing physical therapist assistant programs at Pearl River Community College, Meridian Community College, and Itawamba Community College. Due to the fluctuating market place, expansion of future programs is not warranted.

V. Encourage the continued recruitment of individuals into the profession, beginning with career awareness activities in middle school and continuing into college years.

VI. Encourage greater recruitment of minorities and baccalaureate degree graduates into physical therapy from related fields.

VII. Use incentives to retain physical therapists in the profession.

A. Provide day care services within the health care setting.

B. Provide continuing and specialized education for physical therapists to maintain the highest quality of services.

VIII. Provide greater access to consumer choice of physical therapy services and promote the concept of direct access.

IX. Promote actions to enhance the quality of care through changing the entry degree to the doctoral level. Provide mechanisms for practicing therapists to obtain the doctoral degree.

Speech-Language Pathologists/Audiologists

To increase the number of speech-language pathologists and audiologists in the state, the following strategies are recommended:

I. Expand the educational system to train more speech-language pathologists/audiologists.

II. Develop a plan to more actively recruit speech-language pathology and audiology students.

A. Provide health care linkages in promoting entry into the profession. Career awareness information should be provided to students earlier – perhaps in elementary and middle schools. The type of student attracted to professional programs (honor students) usually decides early about a professional career choice.

B. Provide financial aid to speech-language pathology and audiology students.

1. Support state legislation to increase financial aid.
2. Encourage hospitals not presently providing scholarships/grants to do so.

C. Encourage greater recruitment of minority students into speech-language pathology or audiology careers.