MICHIGAN

Physician Supply and Demand through 2020

The Center for Health Workforce Studies
University at Albany, State University of New York

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Preface

This report presents an analysis of the current physician workforce and forecasts of the future physician workforce in Michigan. It provides forecasts of the supply of and demand for physicians throughout the state by specialty through 2020. This report was prepared for and with funding from the Michigan Blue Ribbon Committee on Physician Workforce. It is one component of the major reform and planning effort initiated by the Michigan Blue Ribbon Committee on Physician Workforce in response to national near-term projections of substantial physician workforce shortages. This report is intended to provide useful information for policy makers, educators, and other interested parties.

This report was prepared by the Center for Health Workforce Studies at the University at Albany, State University of New York. The Center is dedicated to the collection, analysis, and distribution of health workforce data to assist health, professional and educational organizations, policy makers, and the public understand issues related to the supply, demand, distribution, and use of health workers. This report was prepared by Gaetano J. Forte and David P. Armstrong. The views expressed in this report are those of the Center for Health Workforce Studies and do not necessarily represent positions or policies of the School of Public Health, University at Albany, State University of New York; Michigan State University; the College of Human Medicine – Michigan State University; the College of Osteopathic Medicine – Michigan State University; the University of Michigan; the University of Michigan Medical School, Wayne State University; the School of Medicine – Wayne State University; Henry Ford Hospital; Ingham Regional Medical Center; the Michigan Department of Community Health; the Michigan Department of Labor and Economic Growth; the Michigan Association of Health Plans; the Michigan Health Council; the Michigan Health and Hospital Association; the Michigan Osteopathic Association; the Michigan Primary Care Association; the Michigan State Medical Society; the Michigan State Area Health Education Center; or the MSU Institute for Health Care Studies.

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Table of Contents

Executive Summary ES-1
Introduction ES-1
Forecasting Physician Supply and Demand through 2020 in Michigan ES-2
Physician Supply Forecasting ES-4
Physician Demand Forecasting ES-10
Relationship between Physician Supply and Demand in Michigan in 2020 ..... ES-21
Limitations ES-29

Chapter 1: Overview 1

Chapter 2: Background 2

Chapter 3: Demographic Profile of Michigan 5

Chapter 4: Michigan Physician Workforce, 2004 22

Chapter 5: Profile of Medical Education and Training in Michigan, 2005 42

Chapter 6: Physician Supply and Demand Forecasting in the U.S. 61

Chapter 7: Michigan Physician Supply Forecasting 70

Chapter 8: Michigan Physician Demand Forecasting 112

Chapter 9: Relationship between Physician Supply and Demand in Michigan 173

Chapter 10: Limitations 246

References 247

Appendix A-1

Executive Summary

Introduction

An adequate supply and distribution of physicians is an essential component of an effective health care system. While there is no simple ratio to determine how many physicians a nation, state, or region should have, it is possible to evaluate the adequacy of physician supply of a particular geographic area by applying supply and demand models to inform physician workforce decisions. Due to the length of time and great expense required for physician education and training, it is prudent to anticipate likely physician supply and demand imbalances well in advance of their occurrence. To that end, a consortium of stakeholders in Michigan, collectively known as the Blue Ribbon Physician Workforce Committee, commissioned the Center for Health Workforce Studies to conduct an assessment of the future supply and demand for physicians in Michigan through 2020. This brief report highlights the main findings of the Center's physician supply and demand forecasts.

National Physician Shortage Context

In January 2005, the Federal Council on Graduate Medical Education (COGME) released its sixteenth report, *Physician Workforce Policy Guidelines for the United States, 2000 – 2020*. The report detailed forecasts of national physician supply and demand that indicated a substantial shortage of physicians by 2020. The magnitude of the shortage was estimated at 85,000 to 96,000 physicians, or between 7.5 and 8.5 percent of the likely number of physicians required to provide services for the nation's population in 2020.

The COGME's report joined a growing number of voices that had arrived at the same troubling conclusion. In the late 1990s, prominent physician workforce researchers began to question the notion of a national physician surplus widely held earlier in the decade. With aging general and physician populations, a stagnant medical education and training effort, more than 4,000 designated primary care Health Professional Shortage Areas, a decline in the growth of managed care, a willingness of payors to continue supporting rising rates of physician utilization, and reports from a dozen medical specialties of current or impending physician shortages, it no longer made sense to think in terms of physician surpluses. The COGME's report attempted to bring all of these observations together.

One of the failings of the COGME's report, however, was its lack of attention to regional and specialty-specific variations embedded in its forecasts. Thus, one of the ramifications of the report was movement by concerned stakeholders in a number of states to determine how the projected national physician shortage would play out in their areas. Efforts in Wisconsin, Kentucky, Arizona, California, Oregon, North Carolina, Mississippi, Texas, and Massachusetts have been or are being made that examine physician supply and demand. Moreover, in the past several years, specialty-specific examinations in Cardiology, Endocrinology, Allergy and Immunology, Psychiatry, Neurosurgery, Pediatric Subspecialties, Dermatology, Medical Genetics, Radiology, Geriatric Medicine, and Critical Care have also yielded findings of current or future shortages of physicians.

Efforts in Michigan

In 2004, COGME members from Michigan and other state stakeholders began an effort to assess what the projected national physician shortage meant for the state. Coming together as the Blue Ribbon Committee on Physician Workforce, they sought out the same team who conducted the national study that had been summarized in the COGME's report and charged them with replicating as closely as possible the previous study for the Michigan physician workforce.

Two complementary efforts were initiated in Michigan to understand the dynamics around their physician workforce. First, the Michigan Department of Community Health began a 3-year census survey of all physicians licensed to practice medicine in the state in 2005. The survey included a battery of items to collect information on physicians' employment characteristics, demographics, medical specialty, time spent providing patient care, practice capacity and acceptance of Medicaid, plans to continue practice, educational background, professional activities, use of technology, and foreign language proficiency. In the first year, approximately 55 percent of the licensed physicians responded to the survey. A report on the first-year responses was issued in January 2006.

Second, in 2004, the Michigan State Medical Society commissioned a compilation of information to develop physician supply and demand forecasts for the state through 2020. The resultant report was released in June 2005. Using a methodology loosely based on Richard "Buz" Cooper's Trend Model, the medical society's report indicated Michigan could face a shortage of 6,000 physicians by 2020.

The Blue Ribbon Committee-commissioned study furthers the work of the Michigan State Medical Society project. It examined Michigan's physician workforce at a finer level of detail, compiled additional information on Michigan's population and health status trends, applied a more formal modeling approach to its forecast, developed state-level physician supply and demand forecasts under multiple scenarios, and developed specialty-specific regional physician supply and demand forecasts under multiple scenarios.

The current report presents the key findings of the Blue Ribbon Committee on Physician Workforce's study on the future physician supply and demand in Michigan.

Forecasting Physician Supply and Demand through 2020 in Michigan

There are many factors to be considered when forecasting physician supply and demand in a particular area. These include (but are not limited to): the size and characteristics of the current physician supply and of new physicians entering the workforce; how physician services are utilized in terms of the characteristics of patients, the location where they are provided, and who provides them; and the characteristics of the population in the particular area. Also important are potential medical advances, physician practice and migration patterns, public and private health care cost-containment efforts, changes in the health care delivery system and health insurance coverage, and a host of other related factors.

Using forecasting models adapted to include data specific to Michigan, the Center developed a number of supply and demand scenarios to estimate the potential impact of some of the factors listed above. The Center concluded that between 2005 and 2020, growth in the demand for physicians in Michigan will likely outpace growth in the supply of physicians. Thus, Michigan is likely to face a physician shortage by 2020. The expected magnitude of the shortage is approximately 4,400 physicians, or about 12 percent of the number of physicians required to meet the forecast demand for physician services in 2020.

Characteristics of Physicians in Michigan in 2004

The Center obtained the American Medical Association's year-end 2004 Physician Masterfile in order to describe the current physician workforce in Michigan and seed the models with base year information.

There were 29,261 active, patient care physicians practicing in Michigan in 2004. Of those:

- 23,769 (81 percent) were post-resident, active, patient care physicians; 3,981 were training in graduate medical programs; and 1,511 were primarily practicing medicine in non-patient care positions (e.g., administration, research, teaching, etc.);

- slightly more than a quarter (27 percent) were women;

- sixty-eight percent were non-Hispanic White, and 19 percent were Asian/Pacific Islander. Eight percent were underrepresented minorities: 5 percent were Black/African-American and 3 percent were Hispanic/Latino;

- more than half (58 percent) were older than 45 years of age and 11 percent were 65 years of age and older;

- twenty-eight percent were International Medical Graduates (IMGS); that is, they had graduated from a medical school outside the United States and Canada. Nearly three quarters (72 percent) had graduated from a medical school in the United States or Canada (United States Medical Graduates or USMGs), and slightly more than half had graduated from one of the four medical schools in Michigan (note: 38 percent of all active, patient care physicians practicing in Michigan in 2004 graduated from a Michigan medical school); and

- approximately 39 percent practiced in one of the primary care specialties: General/Family Medicine, General Internal Medicine, or General Pediatrics. Six percent were practicing as Obstetrician/Gynecologists. Ten percent were practicing in Internal Medicine Subspecialties. Fifteen percent were practicing in Surgery and related subspecialties. Twelve percent were practicing in facility-based specialties (i.e., Anesthesiology, Pathology, and Radiology). Six percent were practicing in Adult or Child and Adolescent Psychiatry. The remainder (13 percent) were practicing in other specialties.

Physician Supply Forecasting

The model used to forecast the future supply of physicians in Michigan considered the following supply determinants:

- the overall number and composition (gender, age, year of medical school graduation, location of medical school, and practice activity) of the current supply of active physicians in Michigan;
- the overall number and composition of new entrants into the physician workforce by source (allopathic, osteopathic, USMGs, and IMGs);
- retirement, death, and other rates of separation from the physician workforce; and
- rates of physician migration into and out of the state.

For the state-level supply forecasts, the baseline model assumed the physician production, practice patterns, rates of separation from the workforce, and migration patterns would remain constant over the forecast period. Scenarios allowing for variation in the level of physician productivity were developed. Below, the results of the baseline forecasts are presented.

Michigan Physician Supply, 2005 – 2020

The supply model forecast a 10 percent increase in the supply of physicians between 2005 and 2020, with the number of active physicians predicted to increase from 30,366 in 2005 to 33,462 in 2020. Adjusting for the projected population growth in the state (5 percent), the physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 313 physicians per 100,000 population.

Figure ES-1 – Michigan Physician Supply Forecast, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,756	10,428,683	305
2015	32,814	10,599,122	310
2020	33,462	10,695,993	313
Percent Change 2005-2020	10%	5%	5%

Primary care physicians were forecast to grow by 10 percent between 2005 and 2020, with the number of active physicians predicted to increase from 11,744 in 2005 to 12,889 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow from 115 physicians per 100,000 population to 121 physicians per 100,000 population.

Non-primary care physicians were also forecast to grow by 10 percent between 2005 and 2020, with the number of active physicians predicted to increase from 18,622 in 2005 to 20,574 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 192 physicians per 100,000 population.

Figure ES-2 – Michigan Primary Care and Non-Primary Care Physician Supply Forecast, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	12,691	10,599,122	120
2020	12,889	10,695,993	121
Percent Change 2005-2020	10%	5%	5%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,449	10,428,683	186
2015	20,124	10,599,122	190
2020	20,574	10,695,993	192
Percent Change 2005-2020	10%	5%	5%

Specialty-Specific Supply Forecasts

The supply model output forecasts for 18 specialties and specialty groups through 2020 in Michigan. In most cases, the supply of physicians was forecast to grow between 2005 and 2020. With the exception of Cardiologists, Pathologists, and Ophthalmologists, all specialties were forecast to grow. The forecast supply growth showed much variation with General/Family Physicians, General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, General Surgeons, Otolaryngologists, Orthopedic Surgeons, Urologists, and other Surgical Subspecialists growing at rates lower than the overall physician supply; and General Internists, other Internal Medicine Subspecialists, Anesthesiologists, and Emergency Medicine physicians growing at rates higher than the overall physician supply. Many specialties were forecast to grow more slowly than the general population of Michigan, including General Pediatricians, Psychiatrists, General Surgeons, Ophthalmologists, Otolaryngologists, Orthopedic Surgeons, and other Surgical Subspecialists.

Primary Care Specialties

General/Family Medicine

General/Family Physicians were forecast to grow by 7 percent between 2005 and 2020, slightly below the overall predicted rate of growth among primary care physicians, with the number of active General/Family Physicians predicted to increase from 5,080 in 2005 to 5,420 in 2020. Adjusting for the projected population growth in the state, the General/Family Physician to population ratio was predicted to grow from 49.8 physicians per 100,000 population to 50.7 physicians per 100,000 population.

General Internal Medicine

General Internists were forecast to grow by 17 percent between 2005 and 2020, well above the overall predicted rate of growth among primary care physicians, with the number of active

General Internists predicted to increase from 4,742 in 2005 to 5,525 in 2020. Adjusting for the projected population growth in the state, the General Internist to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 51.7 physicians per 100,000 population.

General Pediatrics

General Pediatricians were forecast to grow by just 1 percent between 2005 and 2020, well below the overall predicted rate of growth among primary care physicians, with the number of active General Pediatricians predicted to increase from 1,922 in 2005 to 1,944 in 2020. Adjusting for the projected population growth in the state, the General Pediatrician to population ratio was predicted to decline from 18.8 physicians per 100,000 population to 18.2 physicians per 100,000 population.

Figure ES-3 – Michigan Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	12,691	10,599,122	120
2020	12,889	10,695,993	121
Percent Change 2005-2020	10%	5%	5%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,222	10,428,683	50.1
2015	5,350	10,599,122	50.5
2020	5,420	10,695,993	50.7
Percent Change 2005-2020	7%	5%	2%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,127	10,428,683	49.2
2015	5,375	10,599,122	50.7
2020	5,525	10,695,993	51.7
Percent Change 2005-2020	17%	5%	11%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,958	10,428,683	18.8
2015	1,966	10,599,122	18.5
2020	1,944	10,695,993	18.2
Percent Change 2005-2020	1%	5%	-3%

Non-Primary Care Specialties

Cardiovascular Disease

Cardiologists were forecast to contract by 6 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Cardiologists predicted to decrease from 736 in 2005 to 693 in 2020. Adjusting for the projected population growth in the state, the Cardiologist to population ratio was predicted to decline from 7.2 physicians per 100,000 population to 6.5 physicians per 100,000 population.

Other Internal Medicine Subspecialties

Other Internal Medicine Subspecialists were forecast to grow by 20 percent between 2005 and 2020, well above the overall predicted rate of growth among non-primary care physicians, with the number of active physicians predicted to increase from 2,970 in 2005 to 3,549 in 2020. Adjusting for the projected population growth in the state, the other Internal Medicine

Subspecialist to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 33.2 physicians per 100,000 population.

Obstetrics and Gynecology

Obstetrician/Gynecologists were forecast to grow by 9 percent between 2005 and 2020, slightly below the overall predicted rate of growth among non-primary care physicians, with the number of active Obstetrician/Gynecologists predicted to increase from 1,712 in 2005 to 1,860 in 2020. Adjusting for the projected population growth in the state, the Obstetrician/Gynecologist to population ratio was predicted to increase from 16.8 physicians per 100,000 population to 17.4 physicians per 100,000 population.

Pathology

Pathologists were forecast to contract by 6 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Pathologists predicted to decrease from 717 in 2005 to 676 in 2020. Adjusting for the projected population growth in the state, the Pathologist to population ratio was predicted to decrease from 7.0 physicians per 100,000 population to 6.3 physicians per 100,000 population.

Figure ES-4 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	735	10,428,683	7.0
2015	722	10,599,122	6.8
2020	693	10,695,993	6.5
Percent Change 2005-2020	-6%	5%	-10%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,190	10,428,683	30.6
2015	3,402	10,599,122	32.1
2020	3,549	10,695,993	33.2
Percent Change 2005-2020	20%	5%	14%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,790	10,428,683	17.2
2015	1,840	10,599,122	17.4
2020	1,860	10,695,993	17.4
Percent Change 2005-2020	9%	5%	4%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	702	10,428,683	6.7
2015	688	10,599,122	6.5
2020	676	10,695,993	6.3
Percent Change 2005-2020	-6%	5%	-10%

Psychiatry

Psychiatrists were forecast to grow by less than 1 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Psychiatrists predicted to barely increase from 1,357 in 2005 to 1,362 in 2020. Adjusting for the projected population growth in the state, the Psychiatrist to population ratio was predicted to decrease from 13.3 physicians per 100,000 population to 12.7 physicians per 100,000 population.

Anesthesiology

Anesthesiologists were forecast to grow by 17 percent between 2005 and 2020, well above the overall predicted growth among non-primary care physicians, with the number of active Anesthesiologists predicted to increase from 1,292 in 2005 to 1,506 in 2020. Adjusting for the projected population growth in the state, the Anesthesiologist to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 14.1 physicians per 100,000 population.

Radiology

Radiologists were forecast to grow by 10 percent between 2005 and 2020, about the same as the overall predicted growth among non-primary care physicians, with the number of active Radiologists predicted to increase from 1,375 in 2005 to 1,511 in 2020. Adjusting for the projected population growth in the state, the Radiologist to population ratio was predicted to increase from 13.5 physicians per 100,000 population to 14.1 physicians per 100,000 population.

Emergency Medicine

Emergency Medicine physicians were forecast to grow by 31 percent between 2005 and 2020, far above the overall predicted growth among non-primary care physicians, with the number of active Emergency Medicine physicians predicted to increase from 1,655 in 2005 to 2,175 in 2020. Adjusting for the projected population growth in the state, the Emergency Medicine physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 20.3 physicians per 100,000 population.

Figure ES-5 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,352	10,428,683	13.0
2015	1,363	10,599,122	12.9
2020	1,362	10,695,993	12.7
Percent Change 2005-2020	0%	5%	-4%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,376	10,428,683	13.2
2015	1,448	10,599,122	13.7
2020	1,506	10,695,993	14.1
Percent Change 2005-2020	17%	5%	11%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,440	10,428,683	13.8
2015	1,478	10,599,122	13.9
2020	1,511	10,695,993	14.1
Percent Change 2005-2020	10%	5%	5%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,841	10,428,683	17.7
2015	2,020	10,599,122	19.1
2020	2,175	10,695,993	20.3
Percent Change 2005-2020	31%	5%	25%

General Surgery

General Surgeons were forecast to grow by 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active General Surgeons predicted to only increase from 1,648 in 2005 to 1,695 in 2020. Adjusting for

the projected population growth in the state, the General Surgeons to population ratio was predicted to decrease from 16.1 physicians per 100,000 population to 15.8 physicians per 100,000 population.

Ophthalmology

Ophthalmologists were forecast to contract by 1 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Ophthalmologists predicted to decrease from 668 in 2005 to 663 in 2020. Adjusting for the projected population growth in the state, the Ophthalmologist to population ratio was predicted to decrease from 6.5 physicians per 100,000 population to 6.2 physicians per 100,000 population.

Otolaryngology

Otolaryngologists were forecast to grow by only 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Otolaryngologists predicted to increase from 317 in 2005 to 328 in 2020. Adjusting for the projected population growth in the state, the Otolaryngologist to population ratio was predicted to remain about the same at 3.1 physicians per 100,000 population throughout the forecast period.

Orthopedic Surgery

Orthopedic Surgeons were forecast to grow by 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Orthopedic Surgeons predicted to increase from 844 in 2005 to 872 in 2020. Adjusting for the projected population growth in the state, the Orthopedic Surgeon to population ratio was predicted to decrease very slightly from 8.3 physicians per 100,000 population to 8.2 physicians per 100,000 population.

Figure ES-6 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,681	10,428,683	16.1
2015	1,686	10,599,122	15.9
2020	1,695	10,695,993	15.8
Percent Change 2005-2020	3%	5%	-2%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	671	10,428,683	6.4
2015	662	10,599,122	6.3
2020	663	10,695,993	6.2
Percent Change 2005-2020	-1%	5%	-5%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	320	10,428,683	3.1
2015	325	10,599,122	3.1
2020	328	10,695,993	3.1
Percent Change 2005-2020	3%	5%	-1%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	857	10,428,683	8.2
2015	866	10,599,122	8.2
2020	872	10,695,993	8.2
Percent Change 2005-2020	3%	5%	-1%

Urology

Urologists were forecast to grow by 5 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Urologists predicted to increase from 375 in 2005 to 393 in 2020. Adjusting for the projected population growth in the state, the Urologist to population ratio was predicted to remain about the same at 3.7 physicians per 100,000 population throughout the forecast period.

Other Surgery Subspecialties

Other Surgical Subspecialists were forecast to grow by 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active physicians predicted to increase from 568 in 2005 to 586 in 2020. Adjusting for the projected population growth in the state, the other Surgical Subspecialist to population ratio was predicted to decrease very slightly from 5.6 physicians per 100,000 population to 5.5 physicians per 100,000 population.

Figure ES-7 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	388	10,428,683	3.7
2015	394	10,599,122	3.7
2020	393	10,695,993	3.7
Percent Change 2005-2020	5%	5%	0%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	581	10,428,683	5.6
2015	585	10,599,122	5.5
2020	586	10,695,993	5.5
Percent Change 2005-2020	3%	5%	-2%

Physician Demand Forecasting

The model used to forecast the future demand for physicians in Michigan considered the following demand determinants:

- Physician utilization rates by age, gender, practice setting, insurance status, location of service (rural and urban), and physician specialty.

- Size and composition (age, gender, and location) of the population of the state and sub-state regions.

For the state-level demand forecasts, the baseline model assumed there would be no significant changes to the health care delivery system in Michigan throughout the forecast period. That is, the model assumes that utilization rates of physician services would remain constant by age, gender, practice setting, insurance status, location of service, and physician specialty. Essentially, in the baseline model, the only input that changes is the size and composition of the population. Thus, the baseline model is referred to as the Demographic Only Scenario. Scenarios allowing for variation in the level of insurance in the population; variation in the age-specific utilization of physician services; the elimination of excess, unnecessary physician service

provision; and the effect of the economy on the demand for physicians were also developed. The latter scenario, referred to as the Trend Scenario in recognition of Richard Cooper's Trend Model upon which it is based, was determined to be the most likely demand scenario and was chosen to be presented in this summary. Below, the results of the baseline forecasts and the Trend Scenario are presented.

Michigan Physician Demand, 2005 – 2020

The Demographic Only Scenario forecast a 12 percent increase in the demand for physicians between 2005 and 2020, with the demand for physicians predicted to increase from 30,366 physicians in 2005 to 33,888 in 2020. Adjusting for the projected population growth in the state, the demand for physicians expressed in terms of a physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 317 physicians per 100,000 population.

The Trend Scenario demand model forecast a 25 percent increase in the demand for physicians between 2005 and 2020, with the demand for physicians predicted to increase from 30,366 physicians in 2005 to 37,907 in 2020. Adjusting for the projected population growth in the state, the demand for physicians expressed in terms of a physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 354 physicians per 100,000 population.

Figure ES-8 – Michigan Physician Demand Forecasts, 2005-2020

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	30,366	30,366	10,207,421	297	297
2010	31,488	32,687	10,428,683	302	313
2015	32,686	35,222	10,599,122	308	332
2020	33,888	37,907	10,695,993	317	354
Percent Change 2005-2020	12%	25%	5%	6%	19%

The Demographic Only Scenario forecast a 10 percent increase in the demand for primary care physicians between 2005 and 2020, with the demand for primary care physicians predicted to increase from 11,744 physicians in 2005 to 12,954 in 2020. Adjusting for the projected population growth in the state, the demand for primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 115 physicians per 100,000 population to 121 physicians per 100,000 population.

The Trend Scenario forecast an 18 percent increase in the demand for primary care physicians between 2005 and 2020, with the demand for primary care physicians predicted to increase from 11,744 physicians in 2005 to 13,830 in 2020. Adjusting for the projected population growth in the state, the demand for primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 115 physicians per 100,000 population to 129 physicians per 100,000 population.

The Demographic Only Scenario forecast a 12 percent increase in the demand for non-primary care physicians between 2005 and 2020, with the demand for non-primary care physicians predicted to increase from 18,622 physicians in 2005 to 20,934 in 2020. Adjusting for the projected population growth in the state, the demand for non-primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 196 physicians per 100,000 population.

The Trend Scenario forecast a 29 percent increase in the demand for non-primary care physicians between 2005 and 2020, with the demand for non-primary care physicians predicted to increase from 18,622 physicians in 2005 to 24,077 in 2020. Adjusting for the projected population growth in the state, the demand for non-primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 225 physicians per 100,000 population.

Figure ES-9 – Michigan Primary Care and Non-Primary Care Physician Demand Forecasts, 2005-2020

Primary Care

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	11,744	11,744	10,207,421	115	115
2010	12,107	12,377	10,428,683	116	119
2015	12,524	13,085	10,599,122	118	123
2020	12,954	13,830	10,695,993	121	129
Percent Change 2005-2020	10%	18%	5%	5%	12%

Non-Primary Care

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	18,622	18,622	10,207,421	182	182
2010	19,381	20,310	10,428,683	186	195
2015	20,161	22,136	10,599,122	190	209
2020	20,934	24,077	10,695,993	196	225
Percent Change 2005-2020	12%	29%	5%	7%	23%

Specialty-Specific Demand Forecasts

For each demand scenario, the demand model output forecasts for 18 specialties and specialty groups through 2020 in Michigan. In the Demographic Only Scenario, the demand for physicians was forecast to increase for all specialties with the exception of General Pediatrics. The forecast demand growth showed much variation with demand for General/Family Physicians, Obstetrician/Gynecologists, Psychiatrists, Emergency Medicine physicians, and Otolaryngologists growing at rates lower than the demand for physicians in general; and demand for General Internists, Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Urologists, and other Surgical Specialists growing at rates higher than the demand for physicians in general. In this scenario, one specialty, Obstetrics and Gynecology, was forecast to grow at a slower pace than the population. In all other specialties where demand was forecast to grow, the rate of growth was greater than the rate of growth in the population.

In the Trend Only Scenario, the demand for physicians was forecast to increase for all specialties. The forecast demand growth showed much variation with demand for General/Family Physicians, General Internists, General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, and Emergency Medicine physicians growing at rates lower than the demand for physicians in general; and demand for Cardiologists, other Internal

Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Otolaryngologists, Urologists, and other Surgical Specialists growing at rates higher than the demand for physicians in general. In this scenario, one specialty, Pediatrics, was forecast to grow at a slower pace than the population. In all other specialties where demand was forecast to grow, the rate of growth was greater than the rate of growth in the population.

Primary Care Specialties

General/Family Medicine

The Demographic Only Scenario forecast an 11 percent increase in the demand for General/Family Physicians between 2005 and 2020, slightly above the level of growth in demand predicted for primary care physicians, with the demand for General/Family Physicians predicted to increase from 5,080 physicians in 2005 to 5,631 in 2020. Adjusting for the projected population growth in the state, the demand for General/Family Physicians expressed in terms of a physician to population ratio was predicted to grow from 49.8 physicians per 100,000 population to 52.6 physicians per 100,000 population.

The Trend Scenario forecast an 18 percent increase in the demand for General/Family Physicians between 2005 and 2020, about the same rate of growth in demand predicted for primary care physicians, with the demand for General/Family Physicians predicted to increase from 5,080 physicians in 2005 to 6,012 in 2020. Adjusting for the projected population growth in the state, the demand for General/Family Physicians expressed in terms of a physician to population ratio was predicted to grow from 49.8 physicians per 100,000 population to 56.2 physicians per 100,000 population.

General Internal Medicine

The Demographic Only Scenario forecast a 15 percent increase in the demand for General Internists between 2005 and 2020, somewhat above the level of growth in demand predicted for primary care physicians, with the demand for General Internists predicted to increase from 4,742 physicians in 2005 to 5,458 in 2020. Adjusting for the projected population growth in the state, the demand for General Internists expressed in terms of a physician to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 51.0 physicians per 100,000 population.

The Trend Scenario forecast a 23 percent increase in the demand for General Internists between 2005 and 2020, somewhat above the rate of growth in demand predicted for primary care physicians, with the demand for General Internists predicted to increase from 4,742 physicians in 2005 to 5,827 in 2020. Adjusting for the projected population growth in the state, the demand for General Internists expressed in terms of a physician to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 54.5 physicians per 100,000 population.

General Pediatrics

The Demographic Only Scenario forecast a 3 percent decrease in the demand for General Pediatricians between 2005 and 2020, unlike the growth in demand predicted for primary care physicians, with the demand for General Pediatricians predicted to decrease from 1,922 physicians in 2005 to 1,865 in 2020. Adjusting for the projected population growth in the state, the demand for General Pediatricians expressed in terms of a physician to population ratio was predicted to decrease from 18.8 physicians per 100,000 population to 17.4 physicians per 100,000 population.

The Trend Scenario forecast a 4 percent increase in the demand for General Pediatricians between 2005 and 2020, far below the rate of growth in demand predicted for primary care physicians, with the demand for General Pediatricians predicted to only increase from 1,922 physicians in 2005 to 1,991 in 2020. Adjusting for the projected population growth in the state, the demand for General Pediatricians expressed in terms of a physician to population ratio was predicted to decrease from 18.8 physicians per 100,000 population to 18.6 physicians per 100,000 population.

Figure ES-10 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	11,744	11,744	10,207,421	115	115
2010	12,107	12,377	10,428,683	116	119
2015	12,524	13,085	10,599,122	118	123
2020	12,954	13,830	10,695,993	121	129
Percent Change 2005-2020	10%	18%	5%	5%	12%

General/Family Medicine

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	5,080	5,080	10,207,421	49.8	49.8
2010	5,267	5,384	10,428,683	50.5	51.6
2015	5,453	5,697	10,599,122	51.4	53.7
2020	5,631	6,012	10,695,993	52.6	56.2
Percent Change 2005-2020	11%	18%	5%	6%	13%

General Internal Medicine

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	4,742	4,742	10,207,421	46.5	46.5
2010	4,970	5,081	10,428,683	47.7	48.7
2015	5,207	5,440	10,599,122	49.1	51.3
2020	5,458	5,827	10,695,993	51.0	54.5
Percent Change 2005-2020	15%	23%	5%	10%	17%

General Pediatrics

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,922	1,922	10,207,421	18.8	18.8
2010	1,870	1,912	10,428,683	17.9	18.3
2015	1,864	1,948	10,599,122	17.6	18.4
2020	1,865	1,991	10,695,993	17.4	18.6
Percent Change 2005-2020	-3%	4%	5%	-7%	-1%

Non-Primary Care Specialties

Cardiovascular Disease

The Demographic Only Scenario forecast a 22 percent increase in the demand for Cardiologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Cardiologists predicted to increase from 736 physicians in 2005 to 896 in 2020. Adjusting for the projected population growth in the state, the demand for

Cardiologists expressed in terms of a physician to population ratio was predicted to increase from 7.2 physicians per 100,000 population to 8.4 physicians per 100,000 population.

The Trend Scenario forecast a 40 percent increase in the demand for Cardiologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Cardiologists predicted to increase from 736 physicians in 2005 to 1,031 in 2020. Adjusting for the projected population growth in the state, the demand for Cardiologists expressed in terms of a physician to population ratio was predicted to increase from 7.2 physicians per 100,000 population to 9.6 physicians per 100,000 population.

Other Internal Medicine Subspecialties

The Demographic Only Scenario forecast a 17 percent increase in the demand for other Internal Medicine Subspecialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Internal Medicine Subspecialists predicted to increase from 2,970 physicians in 2005 to 3,470 in 2020. Adjusting for the projected population growth in the state, the demand for other Internal Medicine Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 32.4 physicians per 100,000 population.

The Trend Scenario forecast a 34 percent increase in the demand for other Internal Medicine Subspecialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Internal Medicine Subspecialists predicted to increase from 2,970 physicians in 2005 to 3,991 in 2020. Adjusting for the projected population growth in the state, the demand for other Internal Medicine Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 37.3 physicians per 100,000 population.

Obstetrics and Gynecology

The Demographic Only Scenario forecast a 1 percent increase in the demand for Obstetrician/Gynecologists between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Obstetrician/Gynecologists predicted to slightly increase from 1,712 physicians in 2005 to 1,725 in 2020. Adjusting for the projected population growth in the state, the demand for Obstetrician/Gynecologists expressed in terms of a physician to population ratio was predicted to decrease from 16.8 physicians per 100,000 population to 16.1 physicians per 100,000 population.

The Trend Scenario forecast a 16 percent increase in the demand for Obstetrician/Gynecologists between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Obstetrician/Gynecologists predicted to increase from 1,712 physicians in 2005 to 1,984 in 2020. Adjusting for the projected population growth in the state, the demand for Obstetrician/Gynecologists expressed in terms of a physician to population ratio was predicted to increase from 16.8 physicians per 100,000 population to 18.6 physicians per 100,000 population.

Pathology

The Demographic Only Scenario forecast a 13 percent increase in the demand for Pathologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Pathologists predicted to increase from 717 physicians in 2005 to 809 in 2020. Adjusting for the projected population growth in the state, the demand for Pathologists expressed in terms of a physician to population ratio was predicted to increase slightly from 7.0 physicians per 100,000 population to 7.6 physicians per 100,000 population.

The Trend Scenario forecast a 30 percent increase in the demand for Pathologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Pathologists predicted to increase from 717 physicians in 2005 to 931 in 2020. Adjusting for the projected population growth in the state, the demand for Pathologists expressed in terms of a physician to population ratio was predicted to increase from 7.0 physicians per 100,000 population to 8.7 physicians per 100,000 population.

Figure ES-11 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	736	736	10,207,421	7.2	7.2
2010	780	817	10,428,683	7.5	7.8
2015	835	917	10,599,122	7.9	8.6
2020	896	1,031	10,695,993	8.4	9.6
Percent Change 2005-2020	22%	40%	5%	16%	34%

Other Internal Medicine Subspecialties

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	2,970	2,970	10,207,421	29.1	29.1
2010	3,128	3,277	10,428,683	30.0	31.4
2015	3,298	3,308	10,599,122	31.1	31.2
2020	3,470	3,991	10,695,993	32.4	37.3
Percent Change 2005-2020	17%	34%	5%	12%	28%

Obstetrics and Gynecology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,712	1,712	10,207,421	16.8	16.8
2010	1,740	1,824	10,428,683	16.7	17.5
2015	1,742	1,912	10,599,122	16.4	18.0
2020	1,725	1,984	10,695,993	16.1	18.6
Percent Change 2005-2020	1%	16%	5%	-4%	11%

Pathology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	717	717	10,207,421	7.0	7.0
2010	750	786	10,428,683	7.2	7.5
2015	781	857	10,599,122	7.4	8.1
2020	809	931	10,695,993	7.6	8.7
Percent Change 2005-2020	13%	30%	5%	8%	24%

Psychiatry

The Demographic Only Scenario forecast a 7 percent increase in the demand for Psychiatrists between 2005 and 2020, somewhat below the rate of growth in demand predicted for non-primary care physicians, with the demand for Psychiatrists predicted to increase from 1,357 physicians in 2005 to 1,457 in 2020. Adjusting for the projected population growth in the state, the demand for Psychiatrists expressed in terms of a physician to population ratio was predicted to increase slightly from 13.3 physicians per 100,000 population to 13.6 physicians per 100,000 population.

The Trend Scenario forecast a 23 percent increase in the demand for Psychiatrists between 2005 and 2020, somewhat below the rate of growth in demand predicted for non-primary care physicians, with the demand for Psychiatrists predicted to increase from 1,357 physicians in 2005 to 1,675 in 2020. Adjusting for the projected population growth in the state, the demand for Psychiatrists expressed in terms of a physician to population ratio was predicted to increase from 13.3 physicians per 100,000 population to 15.7 physicians per 100,000 population.

Anesthesiology

The Demographic Only Scenario forecast a 15 percent increase in the demand for Anesthesiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Anesthesiologists predicted to increase from 1,292 physicians in 2005 to 1,483 in 2020. Adjusting for the projected population growth in the state, the demand for Anesthesiologists expressed in terms of a physician to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 13.9 physicians per 100,000 population.

The Trend Scenario forecast a 32 percent increase in the demand for Anesthesiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Anesthesiologists predicted to increase from 1,292 physicians in 2005 to 1,706 in 2020. Adjusting for the projected population growth in the state, the demand for Anesthesiologists expressed in terms of a physician to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 15.9 physicians per 100,000 population.

Radiology

The Demographic Only Scenario forecast a 14 percent increase in the demand for Radiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Radiologists predicted to increase from 1,375 physicians in 2005 to 1,573 in 2020. Adjusting for the projected population growth in the state, the demand for Radiologists expressed in terms of a physician to population ratio was predicted to increase from 13.5 physicians per 100,000 population to 14.7 physicians per 100,000 population.

The Trend Scenario forecast a 32 percent increase in the demand for Radiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Radiologists predicted to increase from 1,375 physicians in 2005 to 1,809 in 2020. Adjusting for the projected population growth in the state, the demand for Radiologists expressed in terms of a physician to population ratio was predicted to increase from 13.5 physicians per 100,000 population to 16.9 physicians per 100,000 population.

Emergency Medicine

The Demographic Only Scenario forecast a 5 percent increase in the demand for Emergency Medicine physicians between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Emergency Medicine physicians predicted to increase from 1,655 physicians in 2005 to 1,743 in 2020. Adjusting for the projected

population growth in the state, the demand for Emergency Medicine physicians expressed in terms of a physician to population ratio was predicted to increase slightly from 16.2 physicians per 100,000 population to 16.3 physicians per 100,000 population.

The Trend Scenario forecast a 21 percent increase in the demand for Emergency Medicine physicians between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Emergency Medicine physicians predicted to increase from 1,655 physicians in 2005 to 2,005 in 2020. Adjusting for the projected population growth in the state, the demand for Emergency Medicine physicians expressed in terms of a physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 18.7 physicians per 100,000 population.

Figure ES-12 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,357	1,357	10,207,421	13.3	13.3
2010	1,403	1,470	10,428,683	13.4	14.1
2015	1,434	1,575	10,599,122	13.5	14.9
2020	1,457	1,675	10,695,993	13.6	15.7
Percent Change 2005-2020	7%	23%	5%	2%	18%

Anesthesiology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,292	1,292	10,207,421	12.7	12.7
2010	1,346	1,410	10,428,683	12.9	13.5
2015	1,411	1,549	10,599,122	13.3	14.6
2020	1,483	1,706	10,695,993	13.9	15.9
Percent Change 2005-2020	15%	32%	5%	10%	26%

Radiology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,375	1,375	10,207,421	13.5	13.5
2010	1,431	1,500	10,428,683	13.7	14.4
2015	1,497	1,644	10,599,122	14.1	15.5
2020	1,573	1,809	10,695,993	14.7	16.9
Percent Change 2005-2020	14%	32%	5%	9%	26%

Emergency Medicine

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,655	1,655	10,207,421	16.2	16.2
2010	1,691	1,772	10,428,683	16.2	17.0
2015	1,720	1,889	10,599,122	16.2	17.8
2020	1,743	2,005	10,695,993	16.3	18.7
Percent Change 2005-2020	5%	21%	5%	1%	16%

General Surgery

The Demographic Only Scenario forecast a 15 percent increase in the demand for General Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for General Surgeons predicted to increase from 1,648 physicians in 2005 to 1,894 in 2020. Adjusting for the projected population growth in the state, the demand for General Surgeons expressed in terms of a physician to population ratio was predicted to increase from 16.1 physicians per 100,000 population to 17.7 physicians per 100,000 population.

The Trend Scenario forecast a 32 percent increase in the demand for General Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for General Surgeons predicted to increase from 1,648 physicians in 2005 to 2,179 in 2020. Adjusting for the projected population growth in the state, the demand for General Surgeons expressed in terms of a physician to population ratio was predicted to increase from 16.1 physicians per 100,000 population to 20.4 physicians per 100,000 population.

Ophthalmology

The Demographic Only Scenario forecast an 18 percent increase in the demand for Ophthalmologists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for Ophthalmologists predicted to increase from 668 physicians in 2005 to 786 in 2020. Adjusting for the projected population growth in the state, the demand for Ophthalmologists expressed in terms of a physician to population ratio was predicted to increase from 6.5 physicians per 100,000 population to 7.3 physicians per 100,000 population.

The Trend Scenario forecast a 35 percent increase in the demand for Ophthalmologists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for Ophthalmologists predicted to increase from 668 physicians in 2005 to 904 in 2020. Adjusting for the projected population growth in the state, the demand for Ophthalmologists expressed in terms of a physician to population ratio was predicted to increase from 6.5 physicians per 100,000 population to 8.5 physicians per 100,000 population.

Otolaryngology

The Demographic Only Scenario forecast a 9 percent increase in the demand for Otolaryngologists between 2005 and 2020, slightly below the rate of growth in demand predicted for non-primary care physicians, with the demand for Otolaryngologists predicted to increase from 317 physicians in 2005 to 347 in 2020. Adjusting for the projected population growth in the state, the demand for Otolaryngologists expressed in terms of a physician to population ratio was predicted to increase slightly from 3.1 physicians per 100,000 population to 3.2 physicians per 100,000 population.

The Trend Scenario forecast a 26 percent increase in the demand for Otolaryngologists between 2005 and 2020, slightly below the rate of growth in demand predicted for non-primary care physicians, with the demand for Otolaryngologists predicted to increase from 317 physicians in 2005 to 399 in 2020. Adjusting for the projected population growth in the state, the demand for Otolaryngologists expressed in terms of a physician to population ratio was predicted to increase from 3.1 physicians per 100,000 population to 3.7 physicians per 100,000 population.

Orthopedic Surgery

The Demographic Only Scenario forecast a 14 percent increase in the demand for Orthopedic Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Orthopedic Surgeons predicted to increase from 844 physicians in 2005 to 958 in 2020. Adjusting for the projected population growth in the state, the demand for Orthopedic Surgeons expressed in terms of a physician to population ratio was predicted to increase from 8.3 physicians per 100,000 population to 9.0 physicians per 100,000 population.

The Trend Scenario forecast a 31 percent increase in the demand for Orthopedic Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Orthopedic Surgeons predicted to increase from 844 physicians in 2005 to 1,102 in 2020. Adjusting for the projected population growth in the state, the demand for Orthopedic Surgeons expressed in terms of a physician to population ratio was predicted to increase from 8.3 physicians per 100,000 population to 10.3 physicians per 100,000 population.

Figure ES-13 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	1,648	1,648	10,207,421	16.1	16.1
2010	1,726	1,809	10,428,683	16.6	17.3
2015	1,811	1,989	10,599,122	17.1	18.8
2020	1,894	2,179	10,695,993	17.7	20.4
Percent Change 2005-2020	15%	32%	5%	10%	26%

Ophthalmology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	668	668	10,207,421	6.5	6.5
2010	701	734	10,428,683	6.7	7.0
2015	741	814	10,599,122	7.0	7.7
2020	786	904	10,695,993	7.3	8.5
Percent Change 2005-2020	18%	35%	5%	12%	29%

Otolaryngology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	317	317	10,207,421	3.1	3.1
2010	327	343	10,428,683	3.1	3.3
2015	337	370	10,599,122	3.2	3.5
2020	347	399	10,695,993	3.2	3.7
Percent Change 2005-2020	9%	26%	5%	4%	20%

Orthopedic Surgery

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	844	844	10,207,421	8.3	8.3
2010	878	921	10,428,683	8.4	8.8
2015	917	1,007	10,599,122	8.7	9.5
2020	958	1,102	10,695,993	9.0	10.3
Percent Change 2005-2020	14%	31%	5%	8%	25%

Urology

The Demographic Only Scenario forecast a 19 percent increase in the demand for Urologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Urologists predicted to increase from 375 physicians in 2005 to 445 in 2020. Adjusting for the projected population growth in the state, the demand for Urologists expressed in terms of a physician to population ratio was predicted to increase from 3.7 physicians per 100,000 population to 4.2 physicians per 100,000 population.

The Trend Scenario forecast a 37 percent increase in the demand for Urologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Urologists predicted to increase from 375 physicians in 2005 to 512 in 2020. Adjusting for the projected population growth in the state, the demand for Urologists expressed in terms of a physician to population ratio was predicted to increase from 3.7 physicians per 100,000 population to 4.8 physicians per 100,000 population.

Other Surgical Specialties

The Demographic Only Scenario forecast a 17 percent increase in the demand for other Surgical Subspecialists between 2005 and 2020, somewhat above the rate of growth in demand predicted

for non-primary care physicians, with the demand for other Surgical Subspecialists predicted to increase from 568 physicians in 2005 to 662 in 2020. Adjusting for the projected population growth in the state, the demand for other Surgical Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 5.6 physicians per 100,000 population to 6.2 physicians per 100,000 population.

The Trend Scenario forecast a 34 percent increase in the demand for other Surgical Specialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Surgical Subspecialists predicted to increase from 568 physicians in 2005 to 762 in 2020. Adjusting for the projected population growth in the state, the demand for other Surgical Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 5.6 physicians per 100,000 population to 7.1 physicians per 100,000 population.

Figure ES-14 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	375	375	10,207,421	3.7	3.7
2010	394	413	10,428,683	3.8	4.0
2015	419	460	10,599,122	4.0	4.3
2020	445	512	10,695,993	4.2	4.8
Percent Change 2005-2020	19%	37%	5%	13%	30%

Other Surgical Subspecialties

Year	Demographic Only Scenario	Trend Scenario	Population	Demographic Only Scenario Physicians per 100,000 Population	Trend Scenario Physicians per 100,000 Population
2005	568	568	10,207,421	5.6	5.6
2010	598	627	10,428,683	5.7	6.0
2015	631	693	10,599,122	6.0	6.5
2020	662	762	10,695,993	6.2	7.1
Percent Change 2005-2020	17%	34%	5%	11%	28%

Relationship between Physician Supply and Demand in Michigan in 2020

In order to clearly indicate the relationship between the projected physician supply and demand in Michigan in 2020, the results of the supply and demand projections are compared in a side-by-side fashion in this section.

Figure ES-15 – Projected Difference Between Physician Supply and Demand in Michigan in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	-425	-1%	-4,444	-12%

At the state level, physician demand was projected to grow at a faster pace than physician supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 2 percent, or 425 physicians by 2020. Expressed as a percentage of the number of physicians

required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 1 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 15 percent, or 4,444 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 12 percent in 2020.

Figure ES-16 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care and Non-Primary Care Specialties

	Demographic Only Scenario		**Trend Scenario**	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Primary Care	-65	-1%	-941	-7%
Non-Primary Care	-360	-2%	-3,503	-15%

Primary care physician demand was also projected to grow at a faster pace than primary care physician supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by less than 1percent, or 65 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to about 1 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 8 percent, or 941 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

Non-primary care physician demand was also projected to grow at a faster pace than non-primary care physician supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 2 percent, or 360 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to about 2 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 19 percent, or 3,503 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 15 percent in 2020.

Specialty-Specific Supply and Demand Relationships

In the Demographic Only Scenario, demand was forecast to grow at a faster rate than supply in General/Family Medicine, Cardiology, Pathology, Psychiatry, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other Surgical Subspecialties. Thus, in these specialties, the Demographic Only Scenario forecasts suggested there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, General Surgery, Ophthalmology, Urology, and other

Surgical Subspecialties where the difference between physician supply and demand was forecast to be at least 10 percent of the forecast demand for physicians in those specialties.

In the Trend Scenario, demand was forecast to grow at a faster rate than supply in all specialties except Emergency Medicine. Thus, in all specialties, except Emergency Medicine, the Trend Scenario forecasts suggested there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, General Surgery, Ophthalmology, Orthopedic Surgery, Urology, and other Surgical Subspecialties where the difference between physician supply and demand was forecast to be at least 20 percent of the forecast demand for physicians in those specialties.

Primary Care Specialties

General/Family Medicine

General/Family physician demand was projected to grow at a faster pace than General/Family physician supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 4 percent, or 211 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 4 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 11 percent, or 592 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 10 percent in 2020.

General Internal Medicine

General Internist demand was not projected to grow consistently at a faster pace than General Internist supply. In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 2 percent, or 67 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 1 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 6 percent, or 302 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 5 percent in 2020.

General Pediatrics

Similarly, General Pediatrician demand was not projected to grow consistently at a faster pace than General Pediatrician supply. In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 4 percent, or 79 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 4 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 3 percent, or 48 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 2 percent in 2020.

Figure ES-17 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care Specialties Detail

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Primary Care (Overall)	-65	-1%	-941	-7%
General/Family Medicine	-211	-4%	-592	-10%
General Internal Medicine	67	1%	-302	-5%
General Pediatrics	79	4%	-48	-2%

Non-Primary Care Specialties

Cardiology

Cardiologist demand was projected to grow, while Cardiologist supply was projected to contract. In the Demographic Only Scenario forecast, demand growth outpaced supply change by 28 percent, or 203 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 23 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 46 percent, or 338 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 33 percent in 2020.

Other Internal Medicine Subspecialties

Other Internal Medicine Subspecialist demand was not projected to grow consistently at a faster pace than other Internal Medicine Subspecialist supply. In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 3 percent, or 79 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 2 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 14 percent, or 442 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 11 percent in 2020.

Obstetrics and Gynecology

Similarly, Obstetrician/Gynecologist demand was not projected to grow consistently at a faster pace than Obstetrician/Gynecologist supply. In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 8 percent, or 134 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 8 percent in 2020. In the Trend

Scenario, demand growth outpaced supply growth by 7 percent, or 125 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 6 percent in 2020.

Pathology

Pathologist demand was projected to grow, while Pathologist supply was projected to contract. In the Demographic Only Scenario forecast, demand growth outpaced supply change by 19 percent, or 133 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 16 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 36 percent, or 255 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 27 percent in 2020.

Figure ES-18 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Cardiology, Other Internal Medicine Subspecialties, Obstetrics and Gynecology, and Pathology

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Cardiology	-203	-23%	-338	-33%
Other Internal Medicine Subspecialties	79	2%	-442	-11%
Obstetrics and Gynecology	134	8%	-125	-6%
Pathology	-133	-16%	-255	-27%

Psychiatry

Psychiatrist demand was projected to grow at a faster pace than Psychiatrist supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 7 percent, or 95 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 7 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 23 percent, or 313 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 19 percent in 2020.

Anesthesiology

Anesthesiologist demand was not projected to grow consistently at a faster pace than Anesthesiologist supply. In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 2 percent, or 23 physicians by 2020. Expressed as a percentage of the number

of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 2 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 15 percent, or 200 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 12 percent in 2020.

Radiology

Radiologist demand was projected to grow at a faster pace than Radiologist supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 4 percent, or 61 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 4 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 22 percent, or 298 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 16 percent in 2020.

Emergency Medicine

Emergency Medicine physician demand was projected to grow at a slower pace than Emergency Medicine physician supply. In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 26 percent, or 432 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 25 percent in 2020. In the Trend Scenario, supply growth outpaced demand growth by 10 percent, or 170 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 8 percent in 2020.

Figure ES-19 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Psychiatry, Anesthesiology, Radiology, and Emergency Medicine

	Demographic Only Scenario		**Trend Scenario**	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Psychiatry	-95	-7%	-313	-19%
Anesthesiology	23	2%	-200	-12%
Radiology	-61	-4%	-298	-16%
Emergency Medicine	432	25%	170	8%

General Surgery

General Surgeon demand was projected to grow at a faster pace than General Surgeon supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 12 percent,

or 200 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 11 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 32 percent, or 484 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 22 percent in 2020.

Ophthalmology

Ophthalmologist demand was projected to grow, while Ophthalmologist supply was projected to contract. In the Demographic Only Scenario forecast, demand growth outpaced supply change by 19 percent, or 123 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 16 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 36 percent, or 241 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 27 percent in 2020.

Otolaryngology

Otolaryngologist demand was projected to grow at a faster pace than Otolaryngologist supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 6 percent, or 19 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 5 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 23 percent, or 71 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 18 percent in 2020.

Orthopedic Surgery

Similarly, Orthopedic Surgeon demand was projected to grow at a faster pace than Orthopedic Surgeon supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 11 percent, or 86 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 9 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 28 percent, or 230 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 21 percent in 2020.

Figure ES-20 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, General Surgery, Ophthalmology, Otolaryngology, and Orthopedic Surgery

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
General Surgery	-200	-11%	-484	-22%
Ophthalmology	-123	-16%	-241	-27%
Otolaryngology	-19	-5%	-71	-18%
Orthopedic Surgery	-86	-9%	-230	-21%

Urology

Urologist demand was projected to grow at a faster pace than Urologist supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 14 percent, or 52 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 12 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 32 percent, or 118 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 23 percent in 2020.

Other Surgical Subspecialties

Other Surgical Subspecialist demand was projected to grow at a faster pace than other Surgical Subspecialist supply. In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 14 percent, or 77 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 12 percent in 2020. In the Trend Scenario, demand growth outpaced supply growth by 31 percent, or 176 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 23 percent in 2020.

Figure ES-21 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Urology and Other Surgical Subspecialties

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Urology	-52	-12%	-118	-23%
Other Surgical Subspecialties	-77	-12%	-176	-23%

Limitations

The findings presented in this summary are subject to a number of limitations that should be considered prior to developing policy based upon them. In general, as with all forecasting endeavors, the forecasts of physician supply and demand presented here were constructed on a foundation of assumptions. These assumptions are associated with the factors that determine physician supply and demand (e.g., number of new entrants into the Michigan physician workforce; age-, gender-, location-, insurance status-specific physician utilization rates; estimated elasticities of physician demand to economic growth/decline; and so forth). To the extent these assumptions fail to hold over the forecast period, the accuracy of the forecasts will suffer. However, the assumptions made were based upon historical data and, where available, Michigan-specific data. Moreover, the construction of multiple scenarios that allow for variation in some of the key assumptions of the forecasting models mitigates the risk of inaccuracy due to ill-chosen assumptions.

Another way to treat the forecasts in this report is to think of them as illustrative of what the future might hold under a specific set of conditions. For example, in one of the demand scenarios developed for this report, it was assumed that all of the unnecessary services provided by physicians would be eliminated by 2020. How likely is it that the health care system will change enough for this assumption to be true? It is not likely at all. However, the scenarios developed with this assumption do illustrate the effect on demand for physicians in such an environment. Thus, one could use this information to know what the effect might be should one-fifth or one-quarter of these services are eliminated. The same could be said for any of the assumptions made in these forecasts.

The findings presented here also do not take into account the potential feedback effects resulting from the predicted national physician shortage or the predicted physician shortage in Michigan. For example, the predicted shortage of Cardiologists nationally may influence young physicians to select Cardiology as a practice specialty at a higher rate than the forecast models assume. Moreover, in response to a widespread shortage of physicians, current practitioners may delay retirement. Further, if demand for physicians were to decrease as sharply as the scenarios in which unnecessary services were eliminated, it is likely that supply would respond by growing at a slower same rate than forecast, reducing the imbalances suggested by the models. There is a

nearly infinite list of other potential feedback effects in response to physician shortages that could affect supply and demand in the future.

Similarly, the findings presented in this summary do not take into account any policy changes that might be wrought as a result of the publication of the findings. While national policies around the physician workforce do not appear to have been affected by the COGME's *Sixteenth Report* as yet, state level initiatives have begun to respond to the predicted shortage of physicians. With a shortage looming, it is likely that competition for physicians among states will increase. In the way states now compete feverishly for new businesses and their accompanying jobs, it will not be surprising if states act similarly with regard to physicians. The nature of this competition is likely to have ramifications for the relationship between physician supply and demand that cannot be accounted for in the current forecasting models.

Chapter 1: Overview

In order to understand how the likely national shortage of physicians will affect the relationship between physicians supply and demand in Michigan, a consortium of concerned stakeholders, the Blue Ribbon Committee on Physician Workforce, contracted with the Center for Health Workforce Studies to assess the adequacy of the physician supply in Michigan through 2020. The project's objective is to provide up-to-date and comprehensive information to state stakeholders to facilitate their efforts to implement policies that assure and adequate supply of physicians throughout the state and minimize the effects of the national shortage of physicians in the state.

This report detailing the results of the Center's assessment of the physician workforce in Michigan is organized as follows:

1) Michigan Population Profile
The population profile presents data compiled from a number of sources, including the U.S. Census Bureau's population estimates and projections, results from the American Community Survey and the Area Resource File. The profile also presents a number of health status indicators derived from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System.

2) Current Michigan Physician Workforce Profile
The physician profile presents data compiled from the American Medical Association's Masterfile of Physicians in the U.S. The profile includes the demographic characteristics (age, gender, race/ethnicity); professional activities (patient care, teaching, research, administration); practice characteristics (specialty, setting, board certification, location of education and training); and county-level and regional distributions of physicians currently practicing in Michigan. More detailed information by specialty, region, and county has been compiled in a stand-alone profile of physicians in *Physician Supply and Distribution in Michigan, 2004* (Forte and Armstrong 2006).

3) Michigan Medical Education and Training Profile
The medical education and training profile presents data on medical education and training efforts in Michigan compiled from the AMA's Graduate Medical Education Database, as well as historical trend data from the *Journal of the American Medical Association's* Annual Medical Education theme issues, and the American Association of Colleges of Osteopathic Medicine.

4) Michigan Physician Supply and Demand Forecasts through 2020
In this section of the report, the Center's efforts to forecast physician supply and demand in Michigan through 2020 are presented. The supply and demand forecasts include state-level and regional-level, specialty-specific projections. In addition, descriptions of the models employed to generate the forecasts are provided. In order to provide a meaningful context to interpret the models and their results, the chapter also includes a broader discussion of the factors affecting physician supply and demand. The forecasting results are presented in three chapters (Chapters 6 through 9), one on the supply forecasts, one on the demand forecasts, and one summarizing the comparisons of the supply and demand forecasts.

Chapter 2: Background

Physician Supply and Demand Forecasting in the U.S.

Nearly 30 years ago, the Graduate Medical Education National Advisory Committee (GMENAC) predicted the nation would possess a relatively large surplus of physicians by the turn of the century. This prediction was made following a 20-year expansion in medical education capacity in the U.S., where the number of annual medical school graduates more than doubled. After the GMENAC report, allopathic medical schools around the country voluntarily capped the production of new physicians. Osteopathic medical schools, on the other hand, did not limit their production of new physicians, growing by more than 100 percent between 1980 and 2000. Graduate medical education did not heed GMENAC's warning either. Between 1980 and 1990, the number of residents training in the U.S. increased by close to 50 percent, from 62,000 to 92,000 residents (Salsberg and Forte, 2002).

Concerns about producing too many physicians continued at the national level, and by the mid-1990s, a number of organizations had joined in a call to limit or reduce the number of physicians being produced in the country. The well-known mantra, "110-50/50," a reference to the federal Council on Graduate Medical Education's (COGME) suggested physician production strategy, was first articulated in the COGME's *Third Report* (1993). The "110" referred to the total number of residency training slots available: 110 percent of the number of U.S. medical school graduates in 1993; while the "50/50" referred to the suggested specialty mix of new physicians: 50 percent primary care and 50 percent specialty disciplines. In 1994, an influential report suggested that under certain managed care delivery systems, physicians were being used much more sparingly (Weiner, 1994). Other recommendations from a consortium of organizations (including the American Medical Association, the American Osteopathic Association, the Association of American Medical Colleges, the American Associations of Colleges of Osteopathic Medicine, the Association of Academic Health Centers, and the National Medical Association) (Consensus Statement, 1997) and the Pew Health Professions Commission (1995) reinforced the COGME suggestions. Finally, in 1997, the federal Balanced Budget Act placed a real cap (in the form of economic disincentives to train more than a certain number of physicians) on graduate medical education.

It was not long, however, before the appropriateness of these recommendations was questioned. Consumer and provider backlash against the cost-cutting limitations imposed by managed care halted staff model HMO penetration well shy of its predicted pervasiveness. Anecdotal evidence began to circulate suggesting primary care physicians were having a more difficult time finding satisfactory practice positions than their specialist counterparts. Reports of specialist shortages (particularly anesthesiologists, radiologists, urologists, child and adolescent psychiatrists) also became more common (Schubert et al., 2003; Miller and Lanier, 2001; Schubert et al., 2001; Foot et al., 2000; Kim et al., 2001; Suneja et al., 2001; Neilson et al., 2001; Angus et al., 2000; Pronovost et al., 2002; Sunshine, 2001; Organ, 2002; Etzoni et al., 2003; Fleming et al., 2003). The concern raised by the rapid aging of the population played into the questioning as well. Ultimately, in 2002 the COGME commissioned a report to re-examine their physician workforce projections.

In January 2005, the COGME released the findings of its re-examination of the previous physician workforce projections in its *Sixteenth Report*, *Physician Workforce Policy Guidelines for the United States, 2000 – 2020*. The report detailed forecasts of national physician supply and demand that indicated a substantial shortage of physicians by 2020. The magnitude of the shortage was estimated at 85,000 to 96,000 physicians, or between 7.5 and 8.5 percent of the likely number of physicians required to provide services for the nation's population in 2020.

The COGME's report joined a growing number of voices that had arrived at the same troubling conclusion. In the late 1990s, prominent physician workforce researchers began to question the notion of a national physician surplus widely held earlier in the decade. With aging general and physician populations, a stagnant medical education and training effort, more than 4,000 designated primary care Health Professional Shortage Areas, a decline in the growth of managed care, a willingness of payors to continue supporting rising rates of physician utilization, and reports from a dozen medical specialties of current or impending physician shortages, it no longer made sense to think in terms of physician surpluses. The COGME's report attempted to bring all of these observations together.

One of the failings of the COGME's report, however, was its lack of attention to regional and specialty-specific variations embedded in its forecasts. Thus, one of the ramifications of the report was movement by concerned stakeholders in a number of states to determine how the projected national physician shortage would play out in their areas. Amid renewed discussion of the adequacy of the physician workforce nationally, several pioneering states have taken it upon themselves to conduct assessments of the adequacy of their supplies of physicians now and with an eye to the future. Arizona, California, Florida, Kentucky University of Kentucky Center, Massachusetts, Michigan, Mississippi, New Mexico, North Carolina, Oregon, Texas, Wisconsin, and others have either finished an assessment or are in the midst of one. Arizona, Florida, and Texas have deemed it necessary to expand medical school capacity in their states in order to assure an adequate supply of physicians in the future. Moreover, as was stated above, in the past several years, specialty-specific examinations in Cardiology, Endocrinology, Allergy and Immunology, Psychiatry, Neurosurgery, Pediatric Subspecialties, Dermatology, Medical Genetics, Radiology, Geriatric Medicine, and Critical Care have also yielded findings of current or future shortages of physicians.

Efforts in Michigan

In 2004, COGME members from Michigan and other state stakeholders began an effort to assess what the projected national physician shortage meant for the state. Coming together as the Blue Ribbon Committee on Physician Workforce, they sought out the same team who conducted the national study that had been summarized in the COGME's report and charged them with replicating as closely as possible the previous study for the Michigan physician workforce.

Two complementary efforts were initiated in Michigan to understand the dynamics around their physician workforce. First, the Michigan Department of Community Health began a 3-year census survey of all physicians licensed to practice medicine in the state in 2005. The survey included a battery of items to collect information on physicians' employment characteristics, demographics, medical specialty, time spent providing patient care, practice capacity and

acceptance of Medicaid, plans to continue practice, educational background, professional activities, use of technology, and foreign language proficiency. In the first year, approximately 55 percent of the licensed physicians responded to the survey. A report on the first-year responses was issued in January 2006.

Second, in 2004, the Michigan State Medical Society commissioned a compilation of information to develop physician supply and demand forecasts for the state through 2020. The resultant report was released in June 2005 (Rosen 2005). Using a methodology loosely based on Richard "Buz" Cooper and colleagues' Trend Model (Cooper 2000a – Conceptual framework, Cooper 2000b – Proceedings, Cooper et al., 2002), the medical society's report indicated Michigan could face a shortage of 6,000 physicians by 2020.

The Blue Ribbon Committee-commissioned study (the current study) furthers the work of the Michigan State Medical Society project. It examines Michigan's physician workforce at a finer level of detail, compiles additional information on Michigan's population and health status trends, applies a more formal modeling approach to its forecast, develops state-level physician supply and demand forecasts under multiple scenarios, and develops specialty-specific regional physician supply and demand forecasts under multiple scenarios.

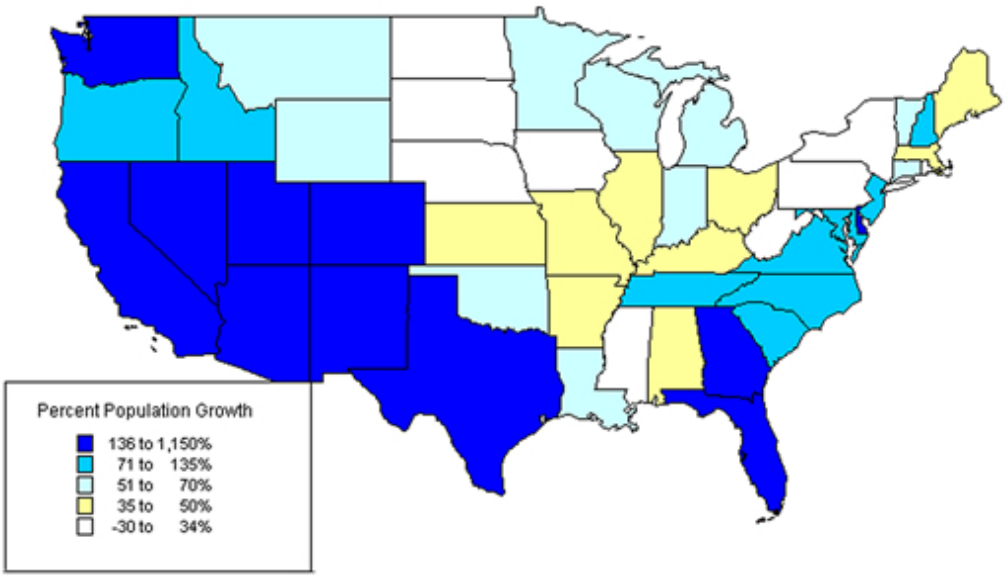
Chapter 3: Demographic Profile of Michigan

National Perspective

Michigan, with an estimated population of 9,938,444 in 2000, was the eighth most populous state in the United States, with approximately 3.5 percent of Americans residing in Michigan. Michigan has ranked among the most populous states since 1950 when its population of 6,371,766 ranked seventh.

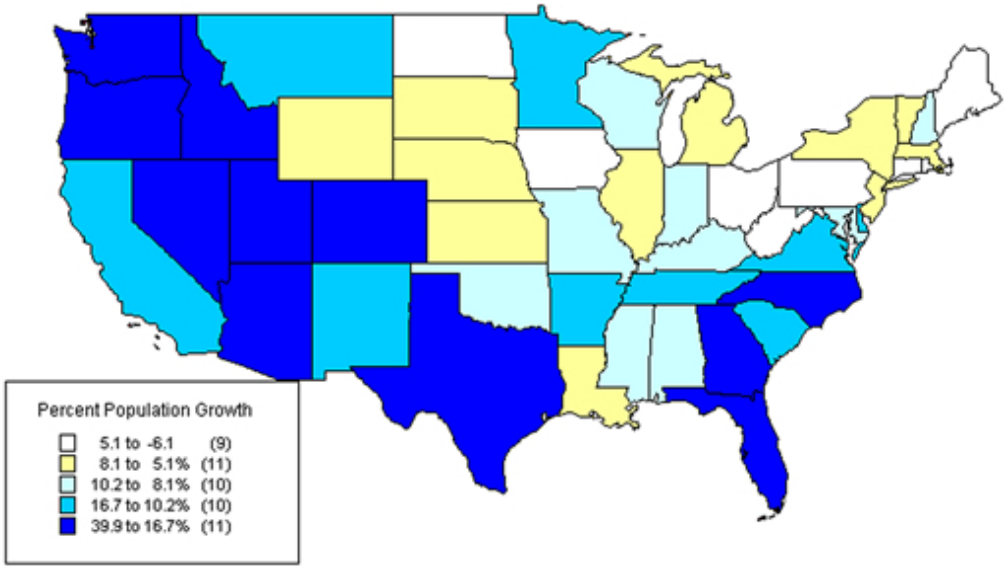
Although Michigan has not grown as quickly in either the short-term or the long-term as some states in other regions of the country, in particularly those in the South and West, its growth was comparable to other states in Midwest. The population of Michigan grew by an estimated 56 percent between 1950 and 2000 (compared to the U.S. population growth of about 86 percent), and an estimated 7 percent between 1990 and 2000 (compared to the U.S. population growth of about 13 percent) (see Figures 1 and 2).

Figure 1 – Population Growth in the United States, 1950-2000



Source: U.S. Census Bureau, 2005

Figure 2 – Population Growth in the United States, 1990-2000

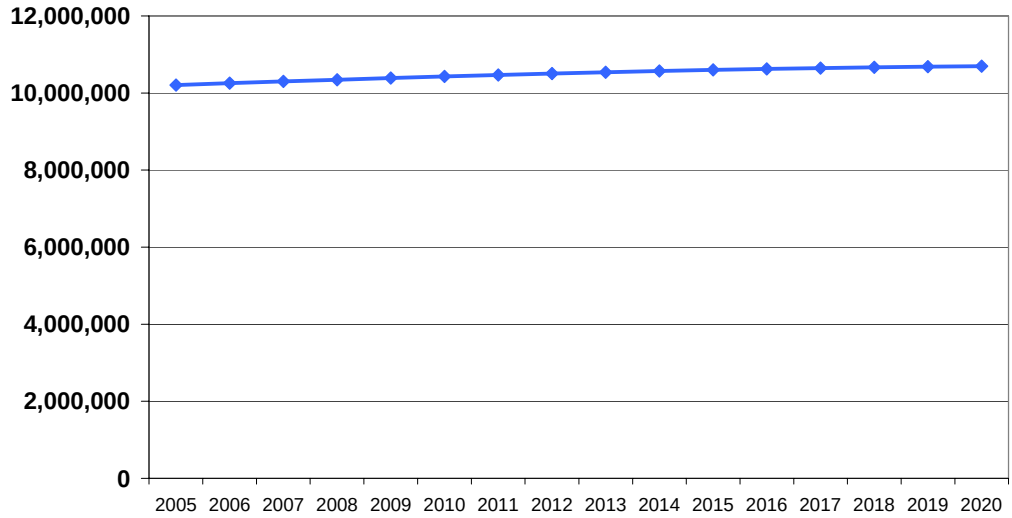


Source: U.S. Census Bureau, 2005

Projected Population Growth

Michigan's moderate to slow population growth was expected to continue through the year 2020, with overall growth for the state between 2005 and 2020 at 4.8 percent. This compared to projected growth of 13.6 percent for the U.S. during the same period. Certain regions of Michigan were expected to grow more rapidly than others during this period, and a few regions were expected to experience population loss (U.S. Census Bureau).

Figure 3 – Projected Population Growth, Michigan, 2005 through 2020



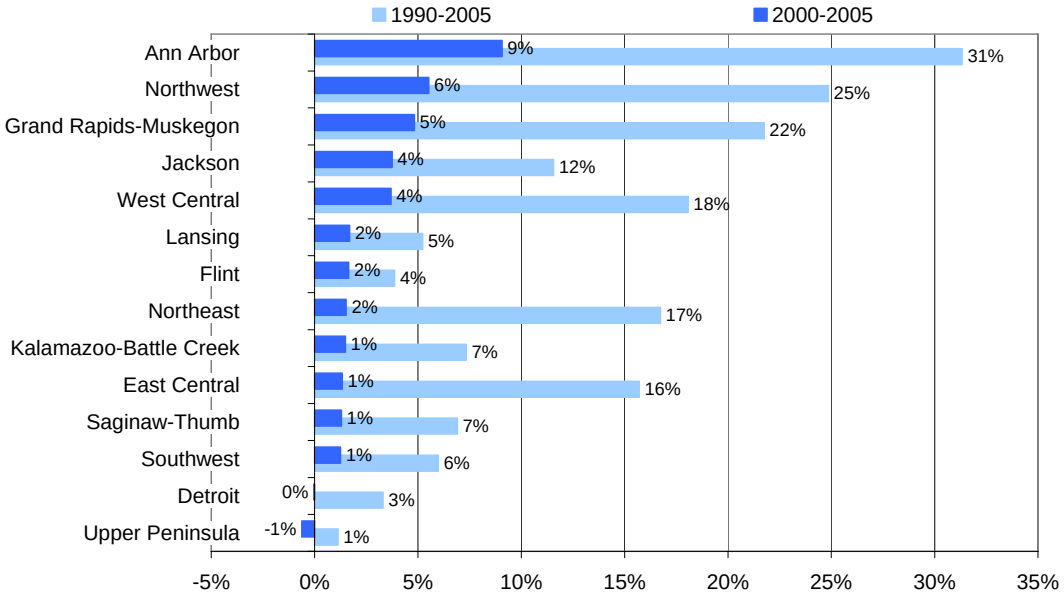
Source: U.S. Census Bureau, 2005.

For the purpose of this examination, Michigan's 82 counties were divided into 14 regions. All of the regions consisted of multiple counties.

The Detroit Area region had the largest population in 2005 (4,278,279), followed by the Grand Rapids-Muskegon region (1,183,252). The Northeast region had the smallest population (142,971), followed by the East Central region (150,382).

The Ann Arbor region experienced the most growth over both the past 15 years and past five years, followed by the Northwest region and Grand Rapids-Muskegon regions, as shown in Figure 4. Many areas of Michigan experienced very little growth in the past five years, however. The population of the Upper Peninsula actually declined by approximately 1 percent since 2000, while the population of Detroit did not grow during this period.

Figure 4 – Historical Population Change by Region, 1990-2005 and 2000-2005



Source: Area Resource File, 2005; U.S. Bureau of the Census, 2006

Most regions in Michigan were expected to grow between 2005 and 2020. Projected rates of growth varied widely by region (Table 1). The region expected to experience the most growth between 2005 and 2020 was the Northwest region (17.3 percent), followed by the Ann Arbor Area region (16.8 percent), and Grand Rapids-Muskegon (14.5 percent). Three regions were expected to experience a population loss by 2020: the Flint Area region (-1.9 percent), the Upper Peninsula region (-1.0 percent), and the Southwest Michigan region (-0.6 percent).

Projected population growth also varied by geographic location within regions. The largest discrepancy in population growth between 2005 and 2020 between rural and urban locations occurred in the Northwest region (15.4 percent versus 22.1 percent), followed by the Jackson Area region (0.2 percent versus 6.7 percent), and the Upper Peninsula region (-4.0 percent versus 2.2 percent).

Table 1 – Population Size and Projected Growth by Region, 2005-2020

Region	Location	2005	2010	2015	2020	% Change 2005 to 2020
Ann Arbor Area	Rural	127,980	134,903	140,985	145,930	14.0%
	Urban	399,398	425,147	448,953	469,961	17.7%
	Total	*527,378*	*560,050*	*589,938*	*615,891*	*16.8%*
Detroit Area	Rural	200,046	203,553	206,061	207,255	3.6%
	Urban	4,078,233	4,121,701	4,143,339	4,137,729	1.5%
	Total	*4,278,279*	*4,325,255*	*4,349,400*	*4,344,984*	*1.6%*
East Central	Rural	116,416	120,103	123,512	126,053	8.3%
	Urban	33,967	35,669	37,246	38,537	13.5%
	Total	*150,382*	*155,772*	*160,758*	*164,590*	*9.4%*
Flint Area	Rural	132,426	130,856	128,734	125,915	-4.9%
	Urban	384,568	385,634	384,783	381,335	-0.8%
	Total	*516,994*	*516,490*	*513,518*	*507,250*	*-1.9%*
Grand Rapids-Muskegon	Rural	299,860	313,096	324,307	332,675	10.9%
	Urban	883,393	935,008	982,303	1,021,726	15.7%
	Total	*1,183,252*	*1,248,104*	*1,306,610*	*1,354,402*	*14.5%*
Jackson Area	Rural	210,689	211,808	212,083	211,035	0.2%
	Urban	253,269	260,324	266,184	270,130	6.7%
	Total	*463,958*	*472,132*	*478,267*	*481,165*	*3.7%*
Kalamazoo-Battle Creek	Rural	201,250	203,826	205,414	205,490	2.1%
	Urban	352,643	360,075	365,917	369,034	4.6%
	Total	*553,893*	*563,902*	*571,330*	*574,525*	*3.7%*
Lansing Area	Rural	118,908	121,465	123,308	124,232	4.5%
	Urban	342,697	349,601	355,154	358,360	4.6%
	Total	*461,605*	*471,067*	*478,463*	*482,592*	*4.5%*
Northeast	Rural	106,169	109,503	112,408	114,610	8.0%
	Urban	36,802	38,420	39,891	41,085	11.6%
	Total	*142,971*	*147,923*	*152,298*	*155,695*	*8.9%*
Northwest	Rural	211,314	223,623	234,685	243,762	15.4%
	Urban	86,919	93,843	100,411	106,149	22.1%
	Total	*298,233*	*317,466*	*335,096*	*349,912*	*17.3%*
Saginaw-Thumb	Rural	294,736	296,643	297,263	296,106	0.5%
	Urban	339,070	342,359	344,168	343,694	1.4%
	Total	*633,806*	*639,002*	*641,430*	*639,800*	*0.9%*
Southwest Michigan	Rural	143,899	143,852	143,239	141,706	-1.5%
	Urban	148,054	148,987	149,295	148,501	0.3%
	Total	*291,953*	*292,839*	*292,535*	*290,207*	*-0.6%*
Upper Peninsula	Rural	162,617	161,108	159,060	156,139	-4.0%
	Urban	151,294	153,176	154,500	154,682	2.2%
	Total	*313,911*	*314,284*	*313,560*	*310,821*	*-1.0%*
West Central	Rural	261,273	269,331	275,820	280,088	7.2%
	Urban	129,534	135,067	140,100	144,073	11.2%
	Total	*390,807*	*404,398*	*415,920*	*424,161*	*8.5%*
Total		*10,207,421*	*10,428,683*	*10,599,122*	*10,695,993*	*4.8%*

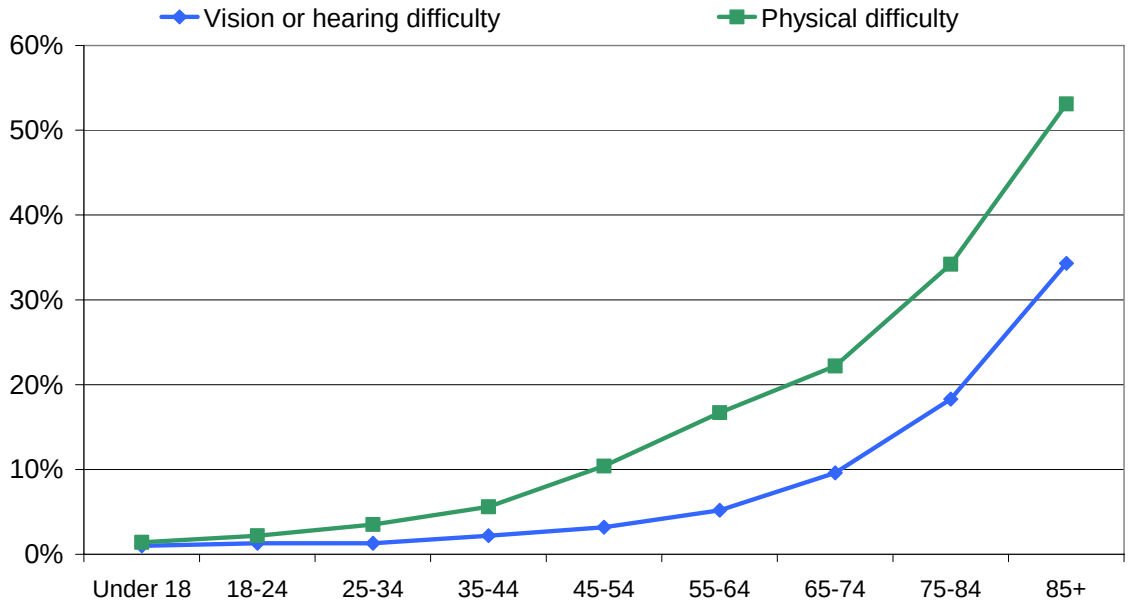
Sources: Center for Health Workforce Studies, Albany, NY, U.S. Bureau of the Census, 2006

The Aging Population

One of the most notable demographic trends projected for the U.S. as a whole as well as the state of Michigan was aging of the population. Lower rates of mortality and greater life expectancy have steadily increased both the number and percentage of the population age 65 and older since the beginning of the 20th century. This increase is expected to accelerate dramatically, too, as members of the baby boom generation (the large cohort born between 1946 and 1964) begin to

turn age 65 in 2011. The consequences of this trend will be especially pronounced for health care. Utilization of health care tends to increase throughout the life course from a low reached approximately between the ages of five and seven. Already, the large cohort of middle-aged baby boomers is experiencing greater disability as they approach their senior years (Figure 5).

Figure 5 – Percentage of Michigan Residents Reporting Vision/Hearing Difficulties or Physical Difficulties by Age, 2005

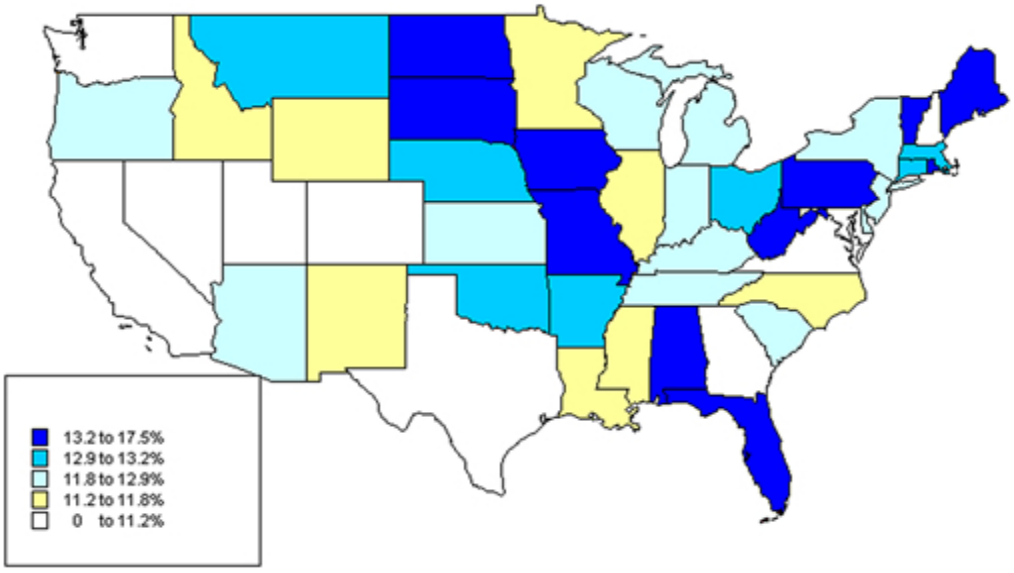


Source: American Community Survey, 2005

One group of older adults that will grow dramatically in the near future is those age 85 and older. These "oldest old" use the most long-term care services. Age-specific utilization rates for nursing homes have been declining, however, as the overall health and disability status of the elderly continues to improve.

In 2000, the percentage of Michigan residents age 65 and older was near the national average, with 12.3 percent of Michigan residents age 65 and older, compared to 12.4 percent for the U.S. overall (see Figure 6).

Figure 6 – Percentage of the Population Age 65 Years and Older in the United States, 2000



Source: U.S. Census Bureau, 2005

There was regional variation in the distribution of older residents, however. In 2004, 20 percent of East Central residents and 19 percent of Northeast residents were age 65 and older, compared to only 9 percent of Ann Arbor area residents and 10 percent of Lansing area residents.

Table 2 – Percent of Population Age 65 and Older by Region, 2004

Region	% Foreign Born
Ann Arbor Area	8%
Detroit Area	8%
East Central	1%
Flint Area	2%
Grand Rapids-Muskegon	5%
Jackson Area	2%
Kalamazoo-Battle Creek	3%
Lansing Area	5%
Northeast	1%
Northwest	2%
Saginaw-Thumb	2%
Southwest	4%
Upper Peninsula	2%
West Central	2%

Source: Area Resource File, 2004

Between 2005 and 2020, the fastest growing group of Michigan residents was projected to be those ages 65 to 74. People in this age group were expected to increase in number by about 59 percent (Tables 3 and 4). They were followed by people age 85 and older, who were expected to increase in number by 34 percent. Two groups of Michigan residents were expected to become

smaller. Those ages 18 to 24 were projected to decline in number by about 7 percent, and those ages 5 to 17 were projected to decline in number by about 5 percent.

Other groups were growing more slowly than the state as a whole. Though the population of Michigan was projected to increase about 5 percent between 2005 and 2020, the number of people ages 25 to 44 was expected to increase by less than 1 percent, and the number of children ages 5 and younger was expected to increase less than 4 percent. Despite the overall trend towards population aging, the number of Michigan residents ages 75 to 84 was expected to increase by only 9 percent by 2020. Those reaching the age of 75 between 2005 and 2020 were born between 1930 and 1945, and were a relatively small birth cohort due to smaller family sizes during the Great Depression (Hauser, 1976).

Table 3 – Projected Regional Population Change by Age Group and Geographic Area, 2005-2020

Region	Location	Under 5	5 to 17	18 to 24	25 to 44	45 to 64	65 to 74	75 to 84	85 +
Ann Arbor Area	Rural	1,314	1,003	2,799	-622	5,094	6,303	1,611	448
	Urban	4,982	3,364	3,680	7,552	18,018	23,143	7,852	1,971
	Total	*6,296*	*4,368*	*6,479*	*6,930*	*23,112*	*29,446*	*9,463*	*2,419*
Detroit Area	Rural	-7	-1,165	2,067	-4,448	4,597	6,098	-830	897
	Urban	-3,230	-58,490	-9,364	-64,195	52,677	126,903	-6,453	21,648
	Total	*-3,237*	*-59,655*	*-7,298*	*-68,643*	*57,274*	*133,001*	*-7,282*	*22,545*
East Central	Rural	264	-2,172	-2,313	3,044	4,308	3,834	1,048	1,624
	Urban	161	-523	-909	1,581	1,538	1,372	730	621
	Total	*425*	*-2,696*	*-3,222*	*4,625*	*5,846*	*5,206*	*1,778*	*2,245*
Flint Area	Rural	-648	-2,436	-393	-5,355	-770	3,048	-171	214
	Urban	-436	-5,717	-4,097	-6,990	118	10,899	1,774	1,217
	Total	*-1,084*	*-8,153*	*-4,490*	*-12,345*	*-652*	*13,947*	*1,603*	*1,431*
Grand Rapids-Muskegon	Rural	2,090	2,123	1,524	7,858	8,044	9,708	463	1,006
	Urban	9,520	8,880	-3,512	46,742	30,375	34,775	6,802	4,751
	Total	*11,610*	*11,003*	*-1,987*	*54,599*	*38,419*	*44,483*	*7,265*	*5,757*
Jackson Area	Rural	-170	-4,028	-2,370	-3,122	1,628	7,471	274	663
	Urban	902	-3,204	-4,541	3,547	5,032	11,384	2,328	1,413
	Total	*732*	*-7,232*	*-6,912*	*425*	*6,660*	*18,856*	*2,602*	*2,075*
Kalamazoo-Battle Creek	Rural	433	-524	-781	-2,027	883	5,689	93	475
	Urban	1,577	-885	-5,267	3,299	2,446	11,610	2,219	1,391
	Total	*2,011*	*-1,408*	*-6,048*	*1,272*	*3,329*	*17,299*	*2,312*	*1,866*
Lansing Area	Rural	334	-233	-735	-1,668	1,550	4,845	836	394
	Urban	1,174	-2,022	-7,558	-306	3,293	15,389	4,178	1,514
	Total	*1,508*	*-2,254*	*-8,293*	*-1,973*	*4,843*	*20,233*	*5,014*	*1,908*
Northeast	Rural	330	-1,674	-1,714	2,757	2,489	4,275	986	992
	Urban	177	-537	-886	1,601	999	1,719	752	458
	Total	*507*	*-2,211*	*-2,600*	*4,358*	*3,487*	*5,994*	*1,738*	*1,450*
Northwest	Rural	1,614	-2,074	-2,409	9,758	7,518	12,162	3,366	2,513
	Urban	931	-485	-1,600	6,354	4,043	6,095	2,485	1,407
	Total	*2,546*	*-2,558*	*-4,010*	*16,112*	*11,561*	*18,257*	*5,851*	*3,920*
Saginaw-Thumb	Rural	-532	-6,243	-3,238	-4,397	1,129	10,657	1,406	2,589
	Urban	-264	-8,024	-7,296	-802	215	13,414	3,663	3,718
	Total	*-797*	*-14,267*	*-10,534*	*-5,199*	*1,344*	*24,070*	*5,069*	*6,307*
Southwest Michigan	Rural	-318	-2,197	-2,032	-866	-1,648	4,294	-67	641
	Urban	-47	-2,384	-3,534	1,411	-1,710	4,992	787	932
	Total	*-365*	*-4,581*	*-5,566*	*545*	*-3,358*	*9,287*	*720*	*1,572*
Upper Peninsula	Rural	-410	-3,929	-4,596	-3,108	-1,810	6,044	-117	1,447
	Urban	133	-2,835	-5,451	1,057	-43	7,108	1,377	2,043
	Total	*-277*	*-6,765*	*-10,048*	*-2,051*	*-1,853*	*13,152*	*1,260*	*3,490*
West Central	Rural	1,298	-1,428	-4,162	4,064	8,253	8,527	1,297	965
	Urban	1,003	-399	-3,561	5,104	4,960	5,087	1,605	740
	Total	*2,302*	*-1,827*	*-7,723*	*9,168*	*13,213*	*13,614*	*2,902*	*1,706*
Total		*22,178*	*-98,236*	*-72,252*	*7,824*	*163,226*	*366,845*	*40,295*	*58,692*

Sources: Center for Health Workforce Studies, Albany, NY, U.S. Bureau of the Census, 2006

Table 4 – Projected Regional Percentage Population Change by Age Group and Geographic Area, 2005-2020

Region	Location	Under 5	5 to 17	18 to 24	25 to 44	45 to 64	65 to 74	75 to 84	85 +
Ann Arbor Area	Rural	16.1%	4.5%	17.9%	-1.5%	16.5%	116.8%	46.0%	35.4%
	Urban	21.1%	5.1%	6.9%	6.2%	18.3%	118.7%	65.5%	45.3%
	Total	*19.8%*	*4.9%*	*9.4%*	*4.3%*	*17.9%*	*118.3%*	*61.1%*	*43.1%*
Detroit Area	Rural	0.0%	-2.9%	13.3%	-7.5%	9.2%	59.4%	-10.2%	28.9%
	Urban	-1.2%	-7.6%	-2.7%	-5.6%	5.1%	52.3%	-3.5%	31.1%
	Total	*-1.1%*	*-7.3%*	*-2.0%*	*-5.7%*	*5.3%*	*52.6%*	*-3.8%*	*31.0%*
East Central	Rural	4.3%	-11.4%	-24.8%	11.1%	13.3%	32.1%	13.6%	66.2%
	Urban	10.0%	-10.0%	-31.1%	21.0%	16.2%	34.5%	30.0%	80.2%
	Total	*5.5%*	*-11.1%*	*-26.3%*	*13.3%*	*13.9%*	*32.7%*	*17.5%*	*69.5%*
Flint Area	Rural	-6.7%	-9.0%	-3.5%	-14.3%	-2.3%	40.6%	-3.3%	12.1%
	Urban	-1.7%	-7.7%	-11.7%	-6.7%	0.1%	43.2%	10.7%	21.5%
	Total	*-3.0%*	*-8.0%*	*-9.7%*	*-8.7%*	*-0.5%*	*42.6%*	*7.4%*	*19.3%*
Grand Rapids-Muskegon	Rural	8.9%	3.5%	5.1%	8.9%	11.8%	68.7%	4.3%	23.0%
	Urban	14.9%	5.2%	-3.7%	18.7%	14.8%	72.0%	19.6%	33.5%
	Total	*13.3%*	*4.8%*	*-1.6%*	*16.2%*	*14.0%*	*71.3%*	*16.0%*	*31.0%*
Jackson Area	Rural	-1.3%	-10.0%	-12.7%	-5.2%	3.0%	62.5%	3.1%	20.3%
	Urban	6.0%	-7.0%	-18.6%	5.1%	7.6%	68.6%	20.3%	32.8%
	Total	*2.6%*	*-8.4%*	*-16.0%*	*0.3%*	*5.5%*	*66.0%*	*12.9%*	*27.4%*
Kalamazoo-Battle Creek	Rural	3.1%	-1.4%	-3.7%	-3.5%	1.8%	50.2%	1.1%	14.7%
	Urban	7.0%	-1.4%	-13.2%	3.4%	2.8%	50.6%	14.0%	22.5%
	Total	*5.5%*	*-1.4%*	*-9.9%*	*0.8%*	*2.5%*	*50.5%*	*9.6%*	*19.8%*
Lansing Area	Rural	4.2%	-1.1%	-5.0%	-4.8%	5.4%	84.6%	20.7%	24.2%
	Urban	5.6%	-3.5%	-16.4%	-0.3%	3.9%	80.8%	32.8%	29.5%
	Total	*5.2%*	*-2.8%*	*-13.6%*	*-1.5%*	*4.3%*	*81.6%*	*29.9%*	*28.2%*
Northeast	Rural	6.0%	-9.4%	-19.9%	10.6%	8.5%	43.9%	14.3%	43.7%
	Urban	10.2%	-9.3%	-27.7%	18.9%	9.7%	44.6%	29.1%	53.6%
	Total	*7.0%*	*-9.4%*	*-22.0%*	*12.7%*	*8.8%*	*44.1%*	*18.3%*	*46.4%*
Northwest	Rural	13.3%	-5.6%	-13.5%	17.2%	13.2%	79.6%	31.1%	60.1%
	Urban	20.4%	-3.3%	-20.2%	28.7%	17.0%	84.4%	51.3%	74.9%
	Total	*15.2%*	*-4.9%*	*-15.6%*	*20.5%*	*14.3%*	*81.2%*	*37.3%*	*64.7%*
Saginaw-Thumb	Rural	-2.8%	-11.0%	-12.8%	-5.6%	1.5%	58.0%	10.6%	46.3%
	Urban	-1.3%	-13.0%	-23.1%	-0.9%	0.2%	55.0%	22.0%	52.8%
	Total	*-2.0%*	*-12.0%*	*-18.5%*	*-3.1%*	*0.8%*	*56.3%*	*16.9%*	*50.0%*
Southwest Michigan	Rural	-3.2%	-8.0%	-16.1%	-2.3%	-4.4%	47.6%	-1.0%	24.5%
	Urban	-0.5%	-8.9%	-25.0%	3.8%	-4.3%	46.7%	10.5%	31.7%
	Total	*-1.9%*	*-8.4%*	*-20.8%*	*0.7%*	*-4.4%*	*47.1%*	*5.1%*	*28.3%*
Upper Peninsula	Rural	-4.9%	-15.4%	-27.4%	-7.2%	-4.2%	51.2%	-1.3%	34.6%
	Urban	1.9%	-12.7%	-32.4%	2.8%	-0.1%	56.5%	14.9%	48.3%
	Total	*-1.8%*	*-14.1%*	*-29.9%*	*-2.5%*	*-2.2%*	*53.9%*	*6.8%*	*41.5%*
West Central	Rural	7.9%	-3.1%	-12.7%	5.5%	13.4%	54.5%	12.4%	24.4%
	Urban	13.5%	-1.8%	-20.3%	14.6%	16.0%	57.0%	28.3%	34.5%
	Total	*9.7%*	*-2.7%*	*-15.4%*	*8.4%*	*14.3%*	*55.4%*	*18.0%*	*27.9%*
Total		*3.3%*	*-5.2%*	*-7.3%*	*0.3%*	*6.3%*	*58.8%*	*9.0%*	*33.9%*

Sources: Center for Health Workforce Studies, Albany, NY, U.S. Bureau of the Census, 2006

Much regional variation existed, however, in projected growth by age. For example, in most regions, the number of residents ages 25 to 44 either grew more slowly than the overall population or actually declined. This age group represents those of prime working age, so this trend has tremendous implications for the supply of health care workers, including physicians. In particular, the Flint Area region and the Detroit Area region experienced population decline in this age group (9 percent and 6 percent respectively). In contrast, the Norwest region experienced 21 percent growth in this age group and the Grand Rapids-Muskegon region experienced 16 percent growth.

All regions experienced greater growth among the 65 to 74 age group than the population as a whole, but in some regions this difference was much greater than in others. For example, in the Ann Arbor Area region the projected growth of this age group was more than 23 times the projected growth of the population overall, and in the Lansing Area and Northwest regions it was more than 16 times the projected growth of the population. In other regions, such as East Central, the disparity in growth rates was smaller; the population overall was expected to grow about 5 percent, while the population between ages 65 to 74 was expected to grow by 33 percent. Similar patterns were observed for the population age 85 and older; all regions experienced growth in this group exceeding overall population growth, but this was much more dramatic in some regions than in others.

Overall, the greatest percentage growth in the number of those age 65 and older occurred in the Ann Arbor Area region (90 percent), followed by the Northwest region (63 percent), and the Lansing Area region (56 percent). The Flint Area region (27 percent), followed by the Detroit Area region (29 percent), and the East Central region (31 percent) experienced the least amount of growth in the number of those age 65 and older.

Growth also varied by rural and urban locations within regions. For example, the 65 to 74 age group in the Detroit Area region was growing faster in rural locations than in urban locations by 7 percent, whereas for the same age group in the Jackson Area region the rural population was growing faster by about 6 percent.

Immigration and Racial/Ethnic Composition

A couple of factors that contributed to the diversity of demographic trends within Michigan were immigration and racial/ethnic composition. The percentage of foreign-born residents in Michigan (5 percent) was considerably lower than the national average (11 percent). Thus, while the impact of immigrants was probably minimal compared to other states with high immigrant populations (e.g., California), the number of immigrants still effected the demand for health care, as foreign-born persons use health care differently and have different health care needs than native-born persons.

Overall, approximately three-fourths of Michigan residents were born in the state and of the 5 percent not born in the U.S., about 46 percent were naturalized citizens (Table 5). Almost 45 percent of the immigrants in Michigan entered the U.S. between 1990 and 2000, compared to only 18 percent between 1980 and 1989 and 38 percent before 1980. The likelihood of naturalized citizenship among immigrants increased with the amount of time they resided in the U.S.; 29 percent of those entering before 1980 became citizens, while only 7 percent entering between 1990 and 2000 became naturalized.

Table 5 – Place of Birth of Michigan Residents, 2000

	Frequency	Percent
Total Population	9,938,444	100.0%
Native U.S.	*9,414,855*	*94.7%*
Born in Michigan	7,490,125	75.4%
Born in Other State	1,867,691	18.8%
Northeast	*260,209*	*2.6%*
Midwest	*742,136*	*7.5%*
South	*697,824*	*7.0%*
West	*167,522*	*1.7%*
Foreign-Born	523,589	5.3%
Naturalized Citizen	*239,955*	*2.4%*
Not a Citizen	*283,634*	*2.9%*
Foreign Born	523,589	100.0%
Year of Entry 1990 to 2000	235,269	44.9%
Naturalized Citizen	*36,057*	*6.9%*
Not a Citizen	*199,212*	*38.0%*
Year of Entry 1980 to 1989	91,415	17.5%
Naturalized Citizen	*51,166*	*9.8%*
Not a Citizen	*40,249*	*7.7%*
Year of Entry before 1980	196,905	37.6%
Naturalized Citizen	*152,735*	*29.2%*
Not a Citizen	*44,173*	*8.4%*

Source: U.S. Census Bureau, 2003

The percentage of the population that was foreign-born varied across regions. The Detroit and Ann Arbor areas had the highest percentages of foreign-born residents (8.0 percent and 7.9 percent respectively), while the North Central and Northeast regions each had populations that were only 1.3 percent foreign-born (Table 6).

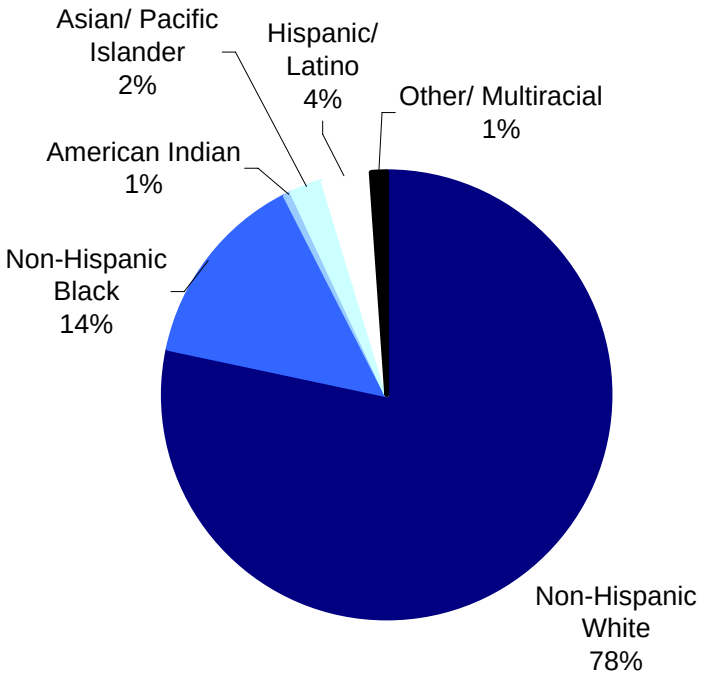
Table 6. – Percentage of Population Foreign-Born, by Region, 2000

Region	% Foreign Born
Ann Arbor	8%
Detroit	8%
East Central	1%
Flint	2%
Grand Rapids-Muskegon	5%
Jackson	2%
Kalamazoo-Battle Creek	3%
Lansing	5%
Northeast	1%
Northwest	2%
Saginaw-Thumb	2%
Southwest	4%
Upper Peninsula	2%
West Central	2%

Source: Area Resource File, 2004

Compared to the nation as a whole in 2003, Michigan had a larger non-Hispanic White population (78 percent compared to 69 percent) (Figure 7). On the other hand, the Black/African-American population was slightly larger than it was nationally (14 percent compared to 13 percent). The most striking feature of Michigan's racial and ethnic composition, however, was the underrepresentation of Hispanics/Latinos. Only 4 percent of Michigan residents were of Hispanic/Latino origins, while the national average was 14 percent.

Figure 7– Racial/Ethnic Composition of Michigan Residents, 2003



Source: U.S. Census Bureau, 2005

The variations in race/ethnicity by region are shown in Table 7. The least diverse regions of Michigan were the Northeast and East Central regions (both approximately 97 percent non-Hispanic White), while other regions such as the Flint Area and Detroit Area regions were much more diverse (76 percent and 67 percent non-Hispanic White, respectively). It is worth noting that although American Indians were a very small percentage of the U.S. population, in some regions of Michigan (e.g., Upper Peninsula and Northeast regions) they were the largest minority group.

Table 7 – Racial/Ethnic Distribution of Michigan Residents by Region, 2003

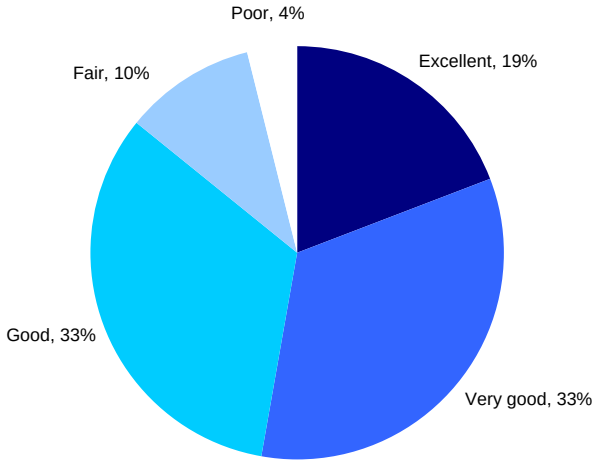
Region	Non-Hispanic White	Non-Hispanic Black	American Indian	Asian/ Pacific Islander	Hispanic/ Latino	Other/ Multiracial
Ann Arbor Area	82%	8%	0%	5%	2%	2%
Detroit Area	67%	25%	0%	3%	3%	1%
East Central	97%	1%	1%	0%	1%	1%
Flint Area	76%	18%	1%	1%	2%	2%
Grand Rapids-Muskegon	82%	7%	1%	2%	7%	1%
Jackson Area	91%	4%	0%	1%	3%	1%
Kalamazoo-Battle Creek	87%	7%	1%	1%	3%	1%
Lansing Area	82%	8%	1%	3%	5%	2%
Northeast	97%	1%	1%	0%	1%	1%
Northwest	94%	2%	1%	0%	2%	1%
Saginaw-Thumb	88%	6%	1%	1%	4%	1%
Southwest	82%	11%	1%	1%	5%	1%
Upper Peninsula	91%	2%	3%	1%	2%	1%
West Central	92%	3%	1%	1%	3%	1%

Source: Area Resource File, 2005

Health Status Indicators

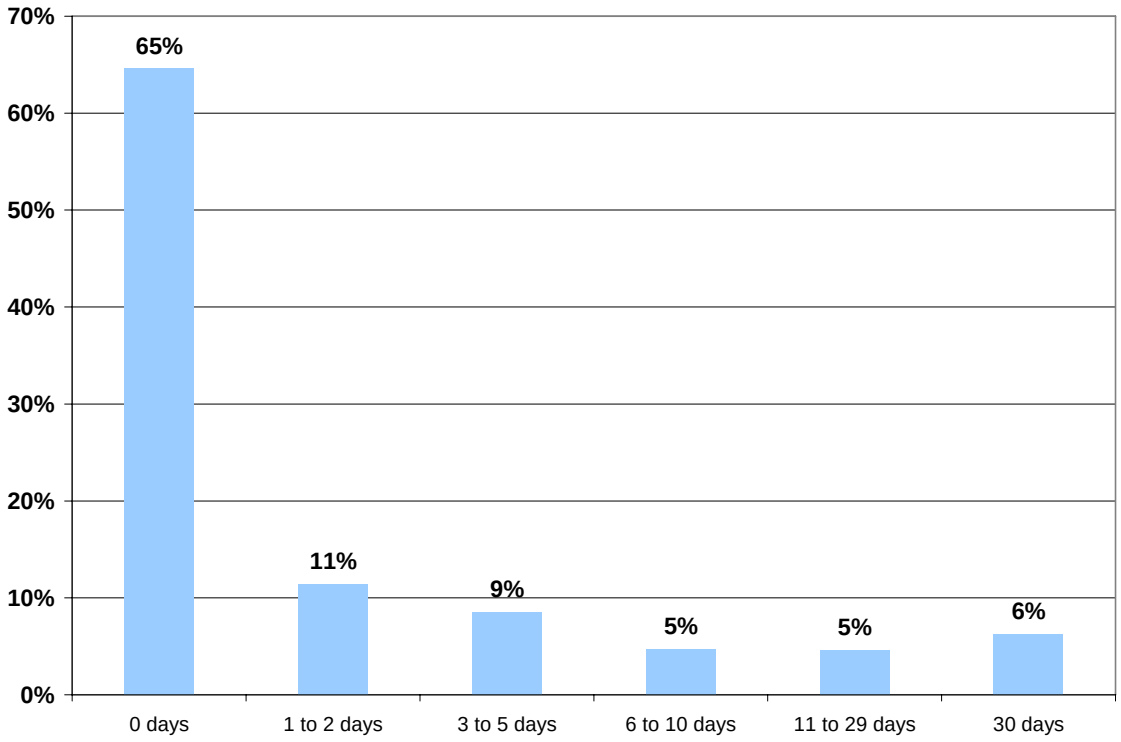
The majority (52 percent) of Michigan residents reported themselves to be in either excellent or very good health (Figure 8). This represented a decline of 11 percent from 1994, however. Very few reported themselves to be in poor health, although the likelihood of such an assessment varied by age and race/ethnicity. Sixty-four percent of Michigan residents reported having no poor health days last month, up from 4 percent in 1994, while only 6 percent reported being in poor health every day the previous month (Figure 9).

Figure 8 – Self-Reported Health Status of Michigan Residents, 2004



Source: CDC Behavioral Risk Factor Surveillance System, 2004

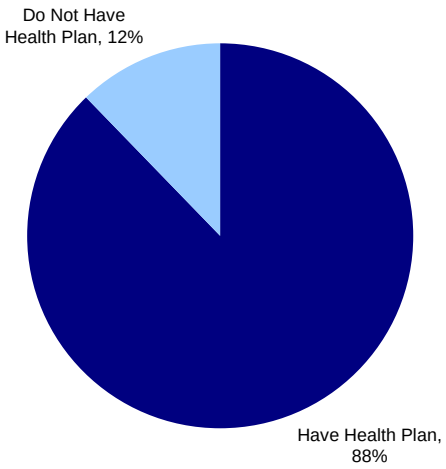
Figure 9 – Self-Reported Number of Poor Health Days Last Month of Michigan Residents, 2004



Source: CDC Behavioral Risk Factor Surveillance System, 2004

Furthermore, about 88 percent of Michigan residents reported having a health plan, down slightly from 90 percent in 1994 (Figure 10). Regional data from 2004 was not available, but 2000 Census data indicated that certain regions had more uninsured individuals than other regions (Table 8). In particular, the East Central, Southwest, and Flint Area regions had large numbers of uninsured individuals (14 percent, 13 percent, and 13 percent, respectively). In contrast, only 8 percent of the residents of Ann Arbor Area region lacked health insurance.

Figure 10 – Percentage of Michigan Residents Reporting Having a Health Plan, 2004



Source: CDC Behavioral Risk Factor Surveillance System, 2004

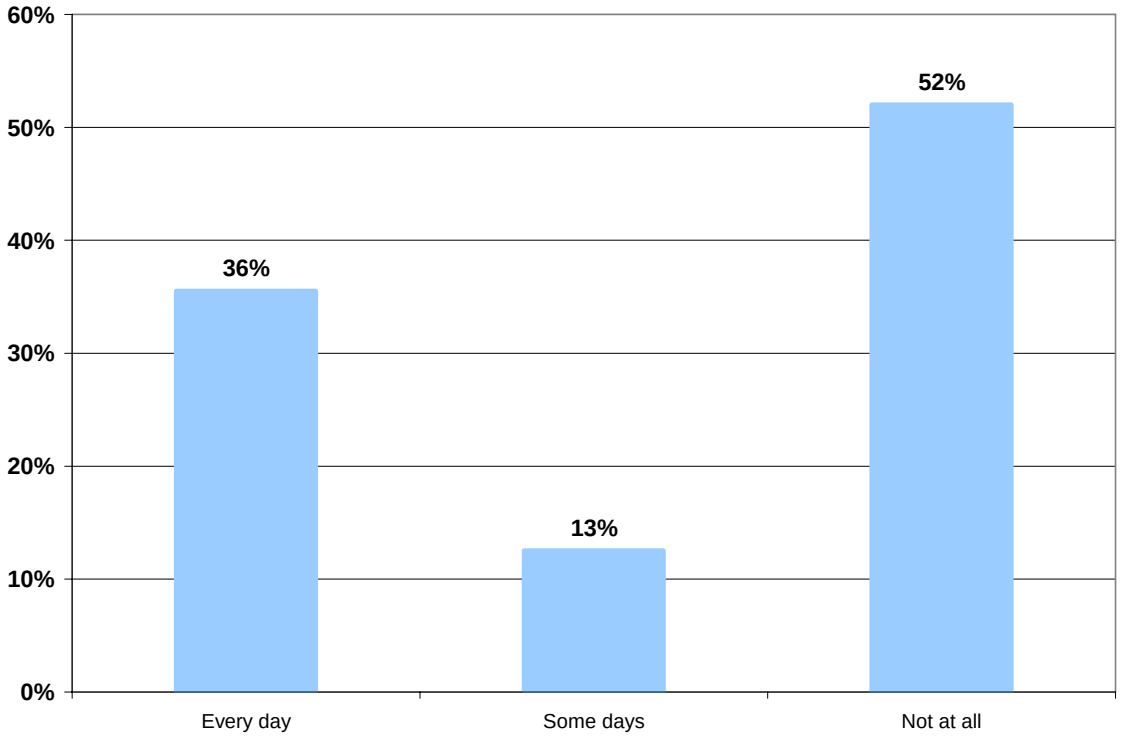
Table 8 – Percent without Health Insurance, by Region, 2000

Region	% Without Health Insurance
Ann Arbor Area	8%
Detroit Area	12%
East Central	14%
Flint Area	13%
Grand Rapids-Muskegon	10%
Jackson Area	10%
Kalamazoo-Battle Creek	11%
Lansing Area	11%
Northeast	12%
Northwest	11%
Saginaw-Thumb	11%
Southwest	13%
Upper Peninsula	11%
West Central	12%

Source: Area Resource File, 2005

A health factor that has been garnering more attention in recent years is smoking. Smoking has been linked to multiple long-term health problems and, as a result, the more Michigan residents who smoke, the greater the potential burden on the health care system in the future. About 36 percent of Michigan residents smoked every day, while only 52 percent did not smoke at all (Figure 11).

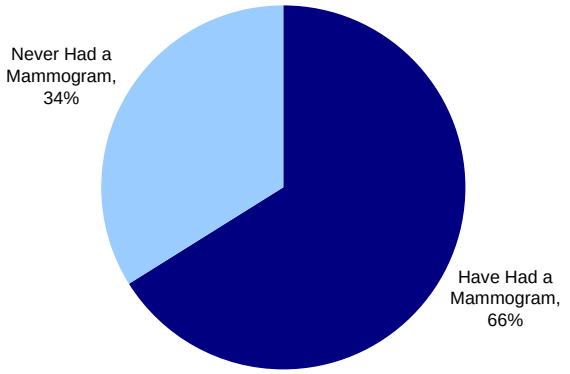
Figure 11 – Self-Reported Smoking Patterns of Michigan Residents, 2004



Source: CDC Behavioral Risk Factor Surveillance System, 2004

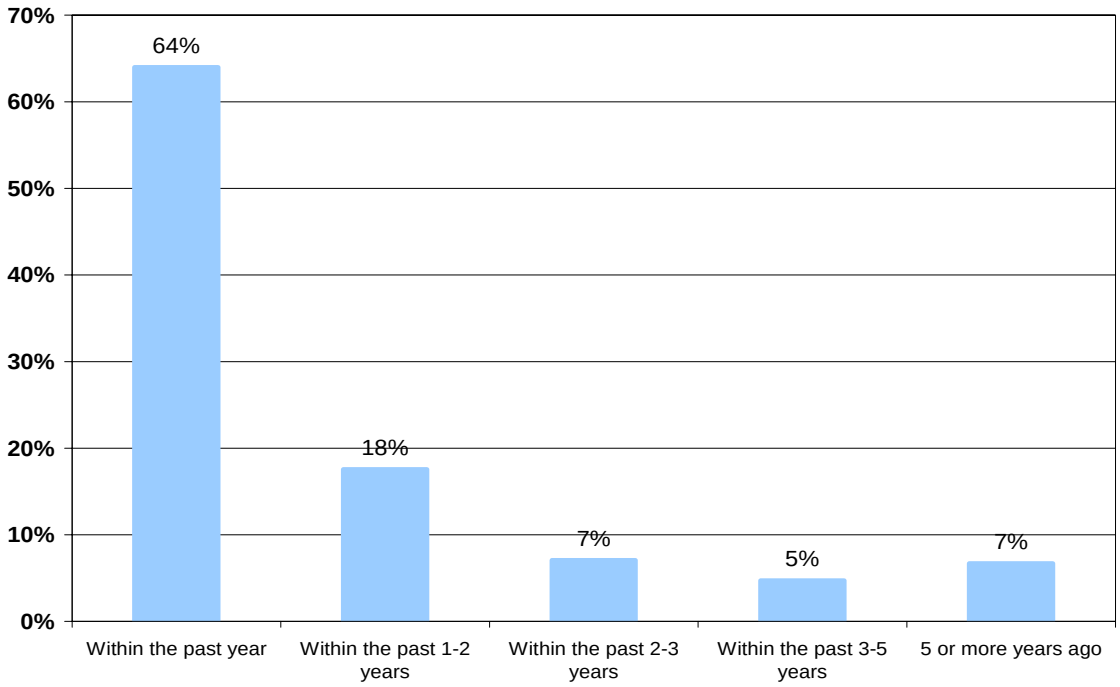
Women's health was also a matter of increasing concern and this was especially the case in regard to breast cancer. One of the best ways for women to protect themselves from breast cancer is to routinely have mammograms done. In 2004, 66 percent of Michigan women reported having ever had a mammogram and of those 64 percent reported having had one in the last year (Figures 12 and 13). In 1994, only 60 percent of women reported ever having had a mammogram.

Figure 12 – Percentage of Michigan Women Reporting Having Ever Had a Mammogram, 2004



Source: CDC Behavioral Risk Factor Surveillance System, 2004

Figure 13 – Percentage of Michigan Women Reporting When They Had Their Last Mammogram, 2004



Source: CDC Behavioral Risk Factor Surveillance System, 2004

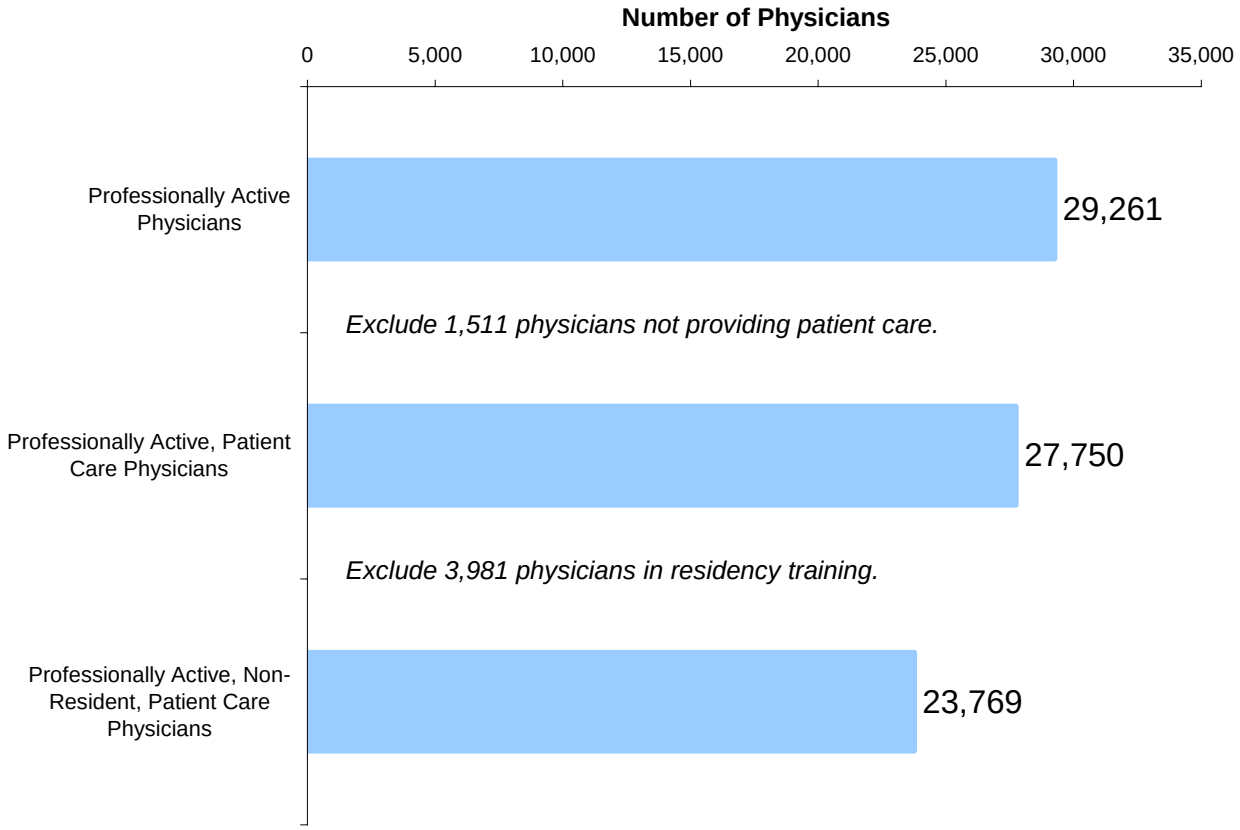
Chapter 4: Michigan Physician Workforce, 2004

Physicians are central to the delivery of health care to the citizens of Michigan. This report provides a variety of quantitative measures on the size, distribution, and characteristics of the physician workforce in Michigan. An effort was made to present tables and charts that reveal patterns to help readers better understand the dynamics of the physician workforce and to design programs and policies to help improve access to health care in the state.

Physician Profile Overview

In 2004, more than 29,000 physicians were active in the state of Michigan. In profiling this population, data were drawn from the American Medical Association (AMA) Physician Masterfile as well as the AMA's Graduate Medical Education Database.

Figure 1 – Active Physicians in Michigan, 2004



Source: American Medical Association Physician Masterfile, December 2004

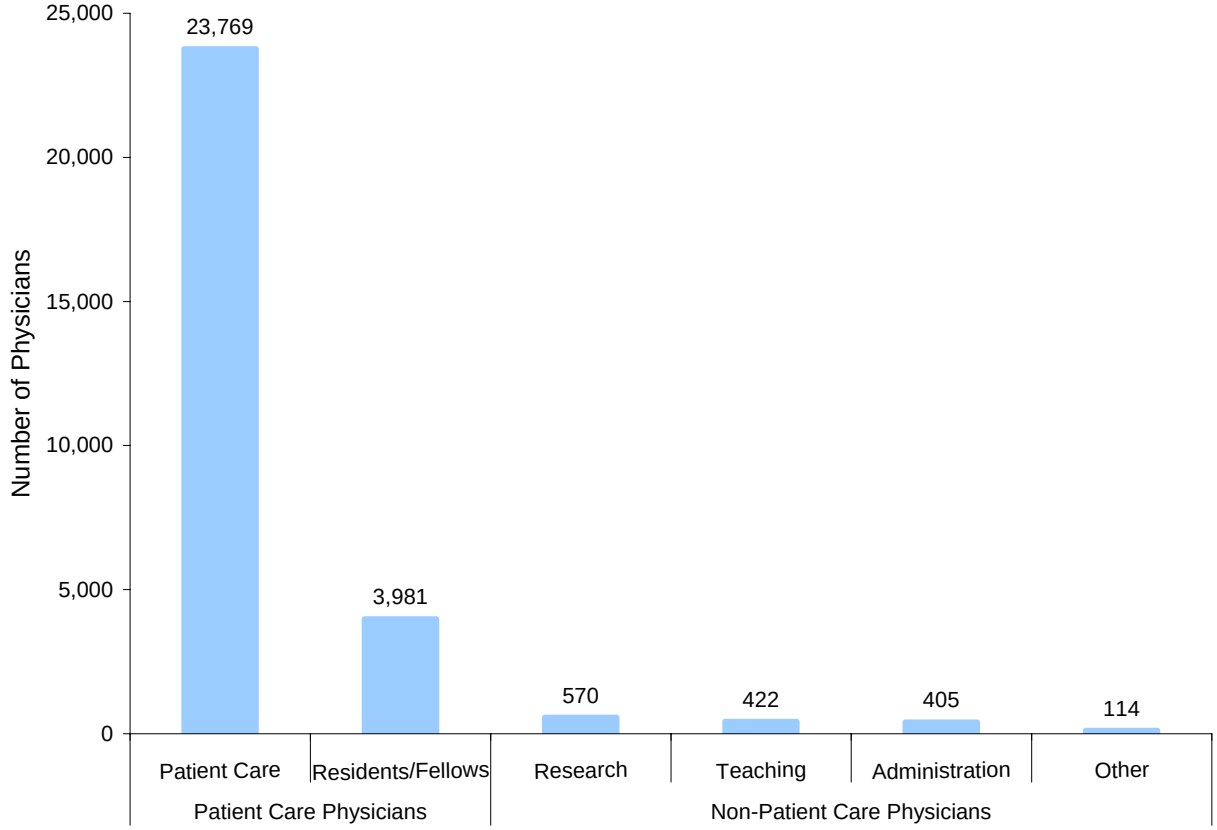
In 2004, there were 29,261 professionally active physicians[1] in the state of Michigan. Of these, 23,769 (81 percent) were active patient care physicians. Another 1,511 (5 percent) were active in

[1] Physicians were considered professionally active if the AMA classified them as neither retired nor inactive in medicine. Physicians whose activity status was unclassified (approximately 2,900) were proportionally allocated to the known activity categories.

the field of medicine, but did not report patient care activity. The remaining 3,981 (5 percent) were in residency or fellowship training (Figure 1).

Figure 2 presents the estimated numbers of active physicians engaged in patient care and non-patient care activities. The figure shows clearly that patient care occupied the majority of Michigan's physicians, while residencies and fellowships (which also typically involve patient care) constituted the second largest activity. Much smaller numbers of physicians were engaged in administration, research, and teaching.

Figure 2 – Estimated Number of Active Physicians in Michigan by Professional Activity, 2004



Source: American Medical Association Physician Masterfile, December 2004

The county with the largest percentage of active physicians was Wayne county (22 percent of all physicians in the state), while one county (Keweenaw) had no active physicians. Estimated counts for each of the 83 counties in the state are provided in Table 1.

The region with the largest percentage of active physicians was the Detroit Area (49 percent), followed by the Ann Arbor Area, with another 12 percent of all physicians in the state. The East Central and Northeast Michigan regions each had less than 1 percent of all the active physicians in the state.

Table 1 – Estimated Number of Active Physicians in Michigan by County, 2004

Region/County	All Active Physicians		Active Patient Care Physicians		Residents/ Fellows		Administration		Research		Teaching	
	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total
Ann Arbor Area	***3,440***	***11.8%***	***2,359***	***9.9%***	***755***	***19.0%***	***58***	***10.1%***	***186***	***44.1%***	***74***	***18.3%***
Livingston	159	0.5%	142	0.6%	13	0.3%	1	0.2%	1	0.3%	1	0.3%
Washtenaw	3,281	11.2%	2,217	9.3%	742	18.6%	57	9.9%	185	43.9%	73	18.0%
Detroit Area	***14,353***	***49.0%***	***11,454***	***48.2%***	***2,211***	***55.5%***	***287***	***50.3%***	***156***	***37.0%***	***185***	***45.7%***
Macomb	1,858	6.3%	1,632	6.9%	173	4.4%	17	3.0%	8	1.9%	20	5.0%
Oakland	5,927	20.3%	4,715	19.8%	961	24.1%	129	22.6%	41	9.7%	52	12.7%
St. Clair	263	0.9%	251	1.1%	6	0.1%	3	0.6%	0	0.1%	1	0.3%
Wayne	6,305	21.5%	4,856	20.4%	1,072	26.9%	137	24.1%	107	25.3%	112	27.7%
East Central	***144***	***0.5%***	***138***	***0.6%***	***5***	***0.1%***	***0***	***0.0%***	***0***	***0.0%***	***0***	***0.0%***
Arenac	11	0.0%	11	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Clare	28	0.1%	28	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Gladwin	19	0.1%	17	0.1%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Iosco	30	0.1%	27	0.1%	2	0.1%	0	0.0%	0	0.0%	0	0.0%
Ogemaw	33	0.1%	32	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Roscommon	24	0.1%	23	0.1%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Flint Area	***1,428***	***4.9%***	***1,165***	***4.9%***	***216***	***5.4%***	***21***	***3.7%***	***3***	***0.8%***	***20***	***5.0%***
Genesee	1,322	4.5%	1,067	4.5%	214	5.4%	19	3.3%	3	0.8%	17	4.2%
Shiawassee	105	0.4%	98	0.4%	2	0.0%	2	0.4%	0	0.0%	3	0.8%
Grand Rapids-Muskegon	***2,654***	***9.1%***	***2,315***	***9.7%***	***257***	***6.5%***	***36***	***6.4%***	***13***	***3.0%***	***25***	***6.3%***
Allegan	65	0.2%	57	0.2%	6	0.2%	1	0.2%	0	0.0%	0	0.0%
Kent	1,875	6.4%	1,584	6.7%	228	5.7%	23	4.1%	10	2.3%	24	5.9%
Muskegon	355	1.2%	338	1.4%	9	0.2%	5	0.8%	2	0.6%	1	0.3%
Oceana	22	0.1%	20	0.1%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Ottawa	338	1.2%	315	1.3%	13	0.3%	7	1.3%	0	0.1%	0	0.1%
Jackson Area	***583***	***2.0%***	***535***	***2.3%***	***32***	***0.8%***	***9***	***1.5%***	***0***	***0.1%***	***2***	***0.6%***
Hillsdale	51	0.2%	46	0.2%	3	0.1%	1	0.2%	0	0.0%	1	0.3%
Jackson	240	0.8%	225	0.9%	10	0.3%	2	0.4%	0	0.0%	1	0.3%
Lenawee	124	0.4%	117	0.5%	5	0.1%	2	0.4%	0	0.0%	0	0.0%
Monroe	169	0.6%	148	0.6%	14	0.4%	3	0.6%	0	0.0%	0	0.0%
Kalamazoo-Battle Creek	***1,426***	***4.9%***	***1,201***	***5.1%***	***137***	***3.4%***	***43***	***7.6%***	***19***	***4.5%***	***17***	***4.2%***
Barry	44	0.1%	43	0.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Branch	61	0.2%	57	0.2%	4	0.1%	0	0.0%	0	0.0%	0	0.0%
Calhoun	324	1.1%	297	1.2%	9	0.2%	12	2.1%	1	0.3%	0	0.0%
Kalamazoo	935	3.2%	745	3.1%	123	3.1%	31	5.4%	17	3.9%	16	4.1%
St. Joseph	63	0.2%	59	0.3%	1	0.0%	0	0.0%	1	0.2%	0	0.0%
Lansing Area	***1,460***	***5.0%***	***1,131***	***4.8%***	***200***	***5.0%***	***48***	***8.4%***	***30***	***7.2%***	***42***	***10.4%***
Clinton	42	0.1%	37	0.2%	4	0.1%	0	0.0%	0	0.0%	0	0.0%
Eaton	117	0.4%	103	0.4%	11	0.3%	2	0.4%	0	0.0%	0	0.0%
Ingham	1,302	4.4%	990	4.2%	184	4.6%	46	8.0%	30	7.1%	42	10.4%

Table 1 – Estimated Number of Active Physicians in Michigan by County, 2004 (cont.)

Region/County	All Active Physicians		Active Patient Care Physicians		Residents/ Fellows		Administration		Research		Teaching	
	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total
Northeast	***232***	***0.8%***	***216***	***0.9%***	***7***	***0.2%***	***2***	***0.4%***	***0***	***0.1%***	***4***	***1.1%***
Alcona	3	0.0%	3	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Alpena	89	0.3%	87	0.4%	1	0.0%	0	0.0%	0	0.0%	1	0.3%
Cheboygan	45	0.2%	42	0.2%	2	0.0%	1	0.2%	0	0.0%	0	0.0%
Crawford	27	0.1%	25	0.1%	2	0.0%	0	0.0%	0	0.0%	0	0.0%
Montmorency	9	0.0%	8	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Oscoda	3	0.0%	2	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%
Ostego	47	0.2%	41	0.2%	3	0.1%	1	0.2%	0	0.0%	2	0.5%
Presque Isle	9	0.0%	9	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Northwest	***825***	***2.8%***	***759***	***3.2%***	***25***	***0.6%***	***20***	***3.6%***	***6***	***1.5%***	***7***	***1.8%***
Antrim	16	0.1%	15	0.1%	0	0.0%	0	0.0%	1	0.2%	0	0.0%
Benzie	22	0.1%	18	0.1%	0	0.0%	1	0.2%	1	0.2%	0	0.0%
Charlevoix	38	0.1%	37	0.2%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Emmet	181	0.6%	170	0.7%	1	0.0%	6	1.1%	2	0.5%	1	0.3%
Grand Traverse	422	1.4%	386	1.6%	18	0.4%	9	1.6%	2	0.5%	4	1.0%
Kalkaska	9	0.0%	8	0.0%	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Leelanau	14	0.0%	12	0.1%	1	0.0%	0	0.0%	0	0.0%	1	0.2%
Manistee	39	0.1%	35	0.1%	1	0.0%	0	0.0%	0	0.0%	1	0.3%
Missaukee	4	0.0%	4	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wexford	81	0.3%	75	0.3%	2	0.1%	3	0.5%	0	0.0%	0	0.0%
Saginaw-Thumb	***1,252***	***4.3%***	***1,113***	***4.7%***	***94***	***2.4%***	***24***	***4.3%***	***2***	***0.5%***	***17***	***4.2%***
Bay	197	0.7%	191	0.8%	5	0.1%	0	0.1%	0	0.1%	0	0.1%
Huron	51	0.2%	47	0.2%	3	0.1%	0	0.0%	0	0.0%	0	0.0%
Lapeer	107	0.4%	100	0.4%	2	0.1%	2	0.4%	0	0.0%	2	0.5%
Midland	205	0.7%	178	0.7%	15	0.4%	6	1.1%	0	0.0%	4	1.0%
Saginaw	606	2.1%	519	2.2%	63	1.6%	12	2.2%	1	0.3%	10	2.6%
Sanilac	41	0.1%	37	0.2%	2	0.0%	2	0.4%	0	0.0%	0	0.0%
Tuscola	46	0.2%	42	0.2%	2	0.1%	1	0.2%	0	0.0%	0	0.0%
Southwest Michigan	***383***	***1.3%***	***364***	***1.5%***	***10***	***0.3%***	***4***	***0.8%***	***1***	***0.3%***	***1***	***0.3%***
Berrien	288	1.0%	270	1.1%	10	0.2%	4	0.7%	1	0.3%	1	0.3%
Cass	23	0.1%	22	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Van Buren	73	0.2%	72	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Upper Peninsula	***622***	***2.1%***	***578***	***2.4%***	***19***	***0.5%***	***13***	***2.2%***	***2***	***0.6%***	***8***	***2.1%***
Alger	11	0.0%	10	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Baraga	9	0.0%	9	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chippewa	57	0.2%	55	0.2%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Delta	64	0.2%	60	0.3%	0	0.0%	1	0.2%	0	0.0%	2	0.5%
Dickinson	79	0.3%	74	0.3%	1	0.0%	2	0.4%	1	0.3%	1	0.3%
Gogebic	27	0.1%	26	0.1%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Houghton	62	0.2%	62	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Iron	13	0.0%	11	0.0%	0	0.0%	1	0.2%	1	0.2%	0	0.0%
Keweenaw	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Luce	11	0.0%	10	0.0%	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Mackinac	15	0.1%	15	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marquette	244	0.8%	217	0.9%	14	0.4%	6	1.1%	0	0.1%	5	1.3%
Menominee	13	0.0%	13	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ontonagon	5	0.0%	5	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Schoolcraft	13	0.0%	12	0.0%	0	0.0%	1	0.2%	0	0.0%	0	0.0%

Table 1 – Estimated Number of Active Physicians in Michigan by County, 2004 (cont.)

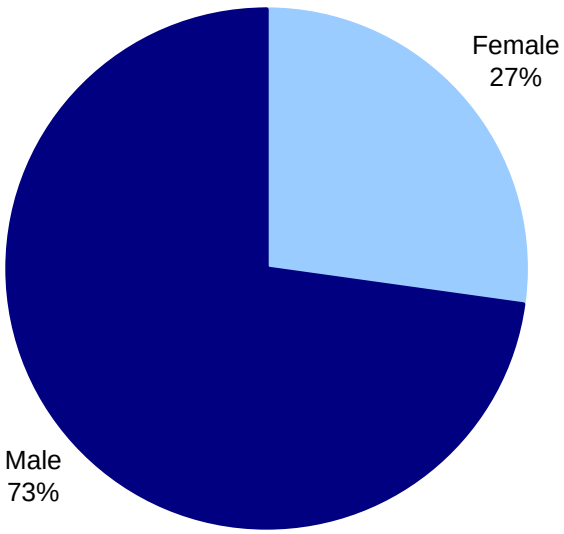
Region/County	All Active Physicians		Active Patient Care Physicians		Residents/ Fellows		Administration		Research		Teaching	
	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total	Number	Percent of MI Total
West Central	***459***	***1.6%***	***439***	***1.8%***	***12***	***0.3%***	***4***	***0.7%***	***2***	***0.4%***	***1***	***0.1%***
Gratiot	67	0.2%	65	0.3%	2	0.0%	0	0.0%	0	0.0%	0	0.0%
Ionia	49	0.2%	45	0.2%	2	0.1%	1	0.2%	0	0.0%	0	0.0%
Isabella	98	0.3%	94	0.4%	2	0.1%	1	0.2%	0	0.0%	0	0.0%
Lake	6	0.0%	5	0.0%	0	0.0%	0	0.0%	1	0.2%	0	0.0%
Mason	56	0.2%	55	0.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mecosta	44	0.2%	42	0.2%	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Montcalm	79	0.3%	78	0.3%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
Newaygo	43	0.1%	39	0.2%	3	0.1%	0	0.0%	0	0.0%	0	0.0%
Osceola	18	0.1%	17	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	***29,261***	***100%***	***23,769***	***100%***	***3,981***	***100%***	***570***	***100%***	***422***	***100%***	***405***	***100%***

Note: Total column does not sum to total due to missing activity information in the AMA Masterfile.
Source: American Medical Association Physician Masterfile, December 2004

Physician Demographics

Physicians in Michigan were predominantly male (73 percent in 2004), as shown in Figure 3. The representation of women varied greatly by specialty. Pediatrics had the largest contingent of women (56 percent). Primary care specialties and obstetrics/gynecology were among the specialties with the greatest proportion of women. Surgery and its related subspecialties had the smallest representation of women.

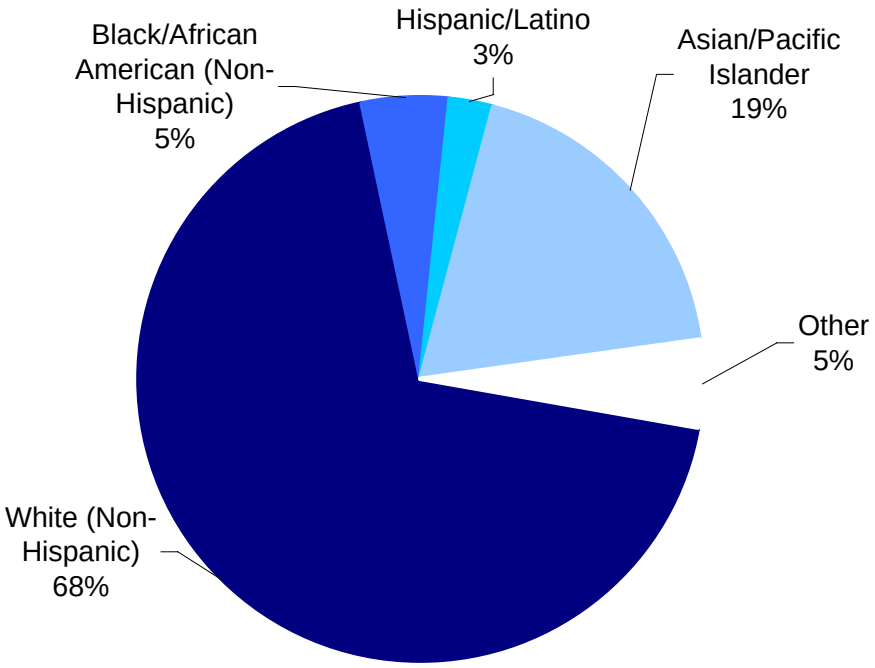
Figure 3 – Gender of Active Patient Care Physicians in Michigan, 2004



Source: American Medical Association Physician Masterfile, December 2004

Figure 4 shows the racial/ethnic composition of Michigan's physicians. The majority of physicians (69 percent) were non-Hispanic White. Asian/Pacific Islander physicians made up the second largest group, representing about 19 percent of physicians. Black/African-Americans made up 5 percent of physicians, and Hispanics/Latinos made up only 3 percent of physicians. Physicians reporting another race or ethnicity (including American Indian/Alaska Natives) made up the remaining 5 percent of the physician workforce.

Figure 4 – Race/Ethnicity of Active Patient Care Physicians in Michigan, 2004



Source: American Medical Association Physician Masterfile, December 2004

The representation of underrepresented minorities varied considerably by specialty (Table 2). Nephrology, Endocrinology and Metabolism, and Preventive Medicine/Occupational Medicine/ Public Health had the largest proportions of underrepresented minorities. Orthopedics had the smallest representation of underrepresented minorities.

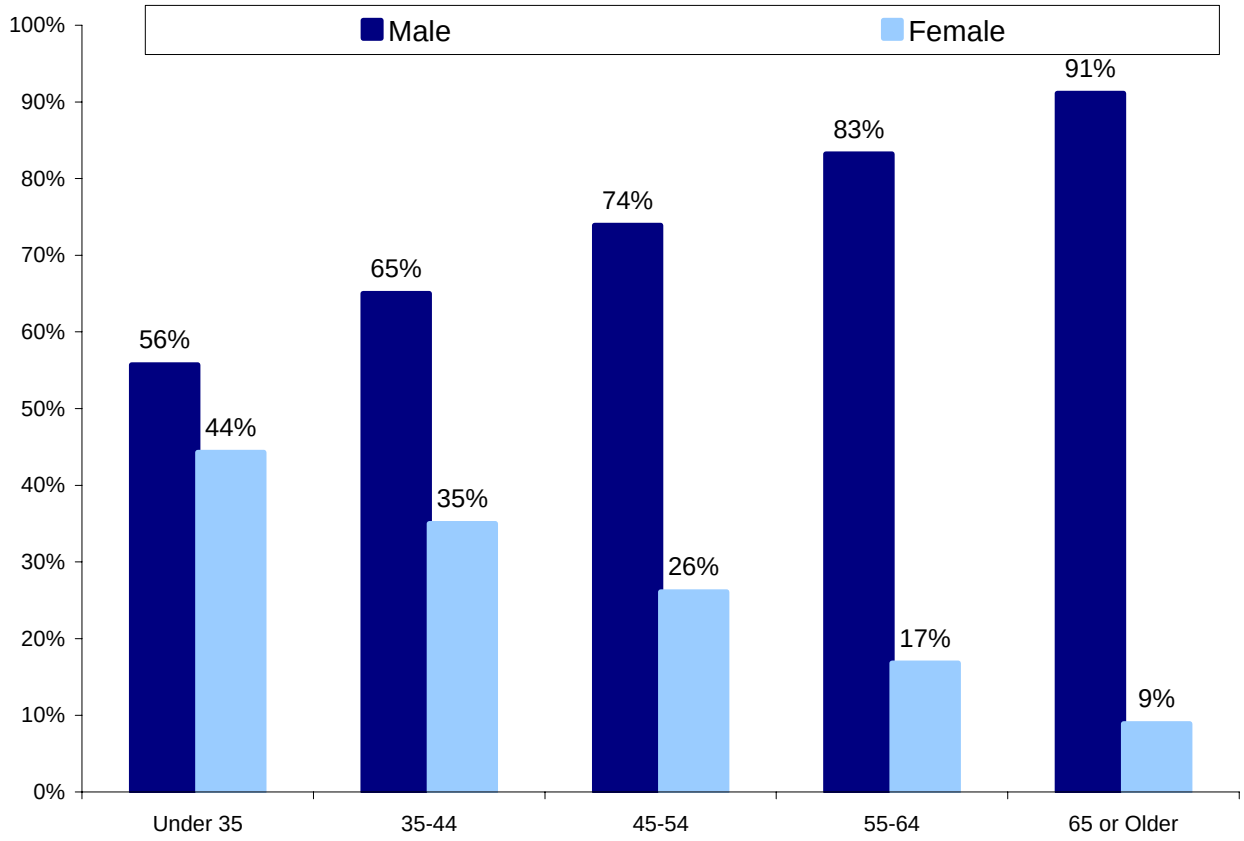
Table 2 – Gender, Race/Ethnicity and IMG Status of Active Patient Care Physicians in Michigan by Specialty, 2004

Specialty	Active Patient Care Physicians	Percent Female	Percent Under-Represented Minority	Percent International Medical Graduate
Primary Care	***8,822***	***34.8%***	***8.9%***	***32.1%***
Family Medicine	3,925	30.5%	8.0%	18.7%
Internal Medicine (General)	3,426	30.9%	9.5%	44.8%
Pediatrics (General)	1,472	55.6%	9.6%	38.2%
Ob/Gyn	***1,342***	***41.0%***	***12.3%***	***18.6%***
Obstetrics & Gynecology	1,276	41.6%	12.7%	17.9%
Gynecology (Only)	66	30.3%	4.3%	30.3%
IM Specialties	***2,167***	***17.6%***	***7.6%***	***44.1%***
Cardiology	602	7.0%	8.1%	43.5%
Endocrinology & Metabolism	97	34.4%	13.8%	48.5%
Gastroenterology	264	11.7%	6.4%	35.6%
Geriatrics	73	38.4%	2.0%	56.2%
Infectious Disease	135	29.9%	5.6%	45.5%
Medical Oncology	183	26.2%	4.3%	40.4%
Nephrology	204	20.2%	15.3%	61.3%
Pulmonary Disease	239	10.0%	7.1%	39.7%
Rheumatology	121	30.6%	6.7%	38.0%
Other Internal Medicine	251	22.6%	5.5%	43.7%
Surgery (General)	***872***	***12.5%***	***8.1%***	***27.9%***
Surgery Specialties	***2,499***	***8.4%***	***5.0%***	***12.6%***
Neurosurgery	147	6.2%	9.7%	23.8%
Ophthalmology	585	15.4%	3.8%	8.0%
Orthopedics	625	4.8%	3.1%	4.3%
Otolaryngology	258	9.7%	5.9%	9.3%
Plastic Surgery	172	9.9%	7.1%	23.4%
Thoracic Surgery	140	0.7%	4.4%	19.4%
Urology	301	4.3%	7.9%	20.9%
Other Surgery Specialties	271	9.2%	4.2%	18.1%
Facility Based	***2,675***	***20.9%***	***5.4%***	***28.1%***
Anesthesiology	974	19.8%	7.5%	29.5%
Pathology	506	28.9%	4.9%	38.5%
Radiology	1,196	18.5%	4.0%	22.7%
Psychiatrists	***1,241***	***35.7%***	***9.6%***	***40.2%***
Psychiatry - Adult	1,048	33.7%	9.4%	40.7%
Psychiatry - Child & Adolescent	193	46.6%	10.7%	37.3%
Other	***3,033***	***26.8%***	***8.0%***	***18.8%***
Allergy & Immunology	150	24.2%	5.3%	32.0%
Dermatology	293	35.3%	7.2%	4.5%
Emergency Medicine	1,095	22.4%	7.6%	7.3%
Neurology	396	25.5%	4.6%	40.6%
Pediatrics Subspecialties	458	35.4%	8.6%	31.9%
Physical Medicine & Rehab	300	29.6%	9.4%	18.6%
Prev Med/Occ Med/Public Hlth	168	22.6%	17.4%	17.3%
Other	173	23.1%	8.5%	26.4%
Total	***23,769***	***27.2%***	***8.0%***	***27.8%***

Note: Total column does not sum to total due to missing specialty information in the AMA Masterfile.
Source: American Medical Association Physician Masterfile, December 2004

Reflecting the growing numbers of women entering the medical profession, female physicians were significantly younger than men in 2004, constituting 44 percent of physicians younger than age 35, but only 9 percent of physicians older than age 65 (Figure 5). Overall, 58 percent of physicians were age 45 or older. Eleven percent of all physicians in Michigan were older than age 65. The median age for all physicians in Michigan was 47, although this varied by gender. Median age for female physicians was only 44, compared to 51 for male physicians.

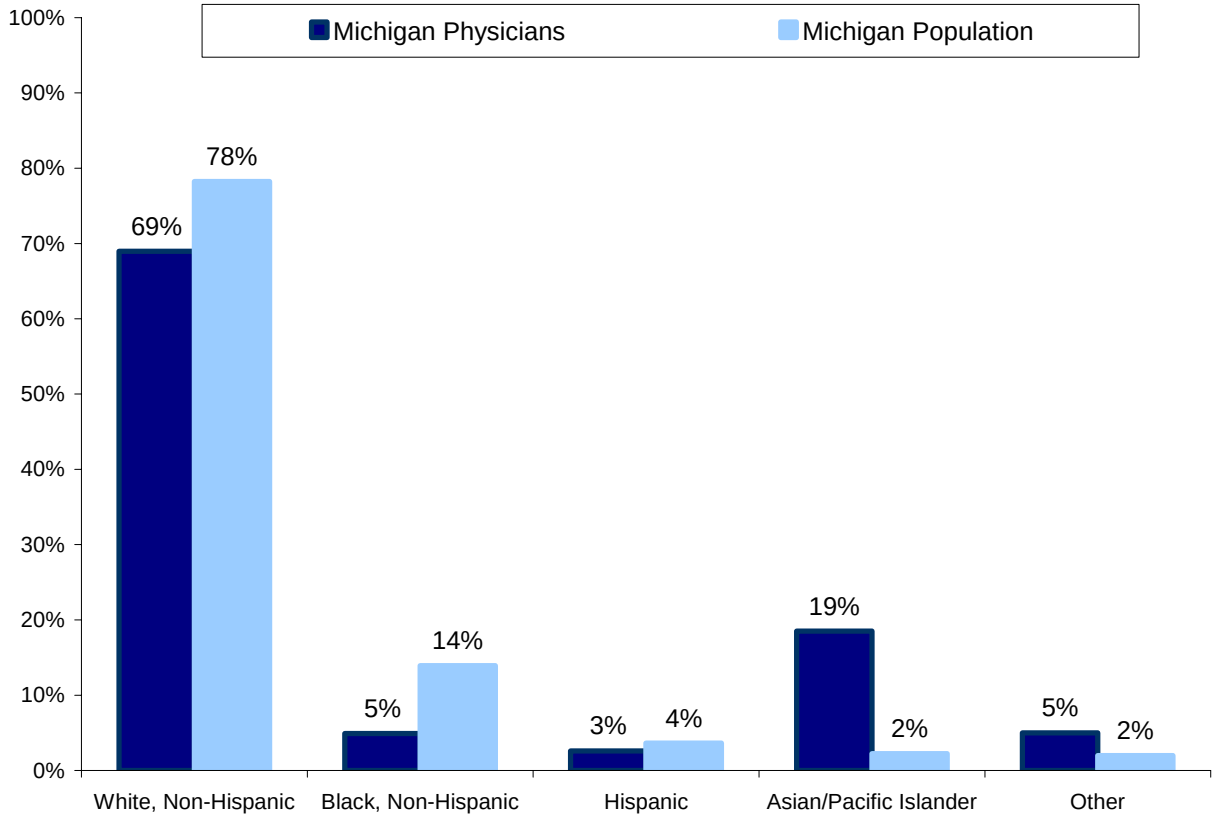
Figure 5 – Gender of Active Patient Care Physicians in Michigan by Age, 2004



Source: American Medical Association Physician Masterfile, December 2004

Comparing Michigan's physician workforce to the state's population resulted in several meaningful findings (Figure 6). In terms of minority populations, Black/African-Americans made up a larger portion of the overall population (14 percent) than they did of the physician population (5 percent); Hispanics/Latinos were more similarly represented, making up 4 percent of the state's population and 3 percent of the physician workforce; and Asian/Pacific Islanders were greatly overrepresented, making up just 2 percent of the state's population, but 19 percent of the physician workforce.

Figure 6 – Race/Ethnicity of Active Patient Care Physicians in Michigan Compared to Michigan Population, 2004

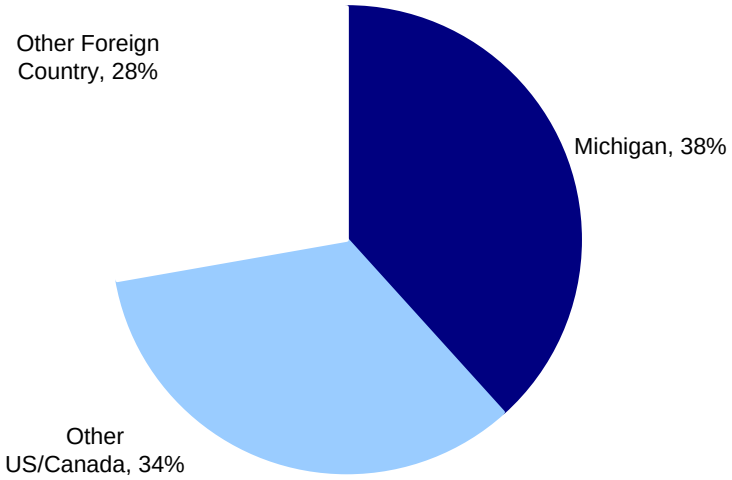


Sources: American Medical Association Physician Masterfile, December 2004; Woods and Poole 2005

Medical Education and Residency Training

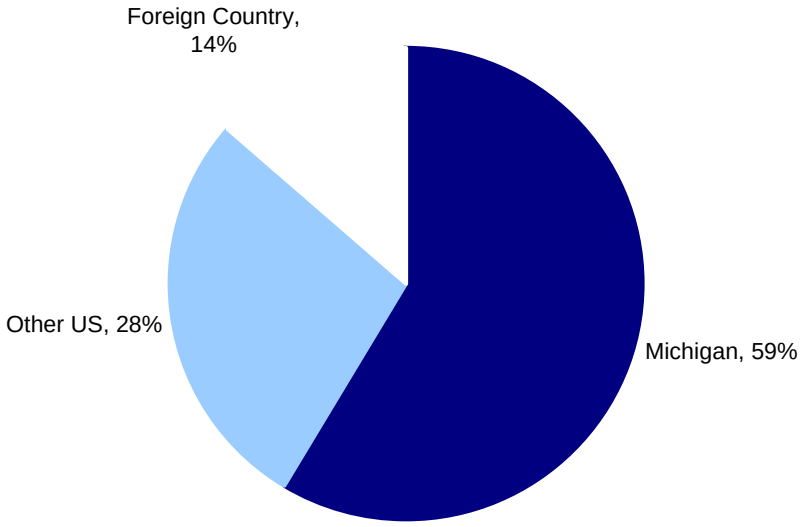
Michigan imported the majority of its physicians from outside the state (about 62 percent attended a medical school outside the state). The proportion having attended medical school in Michigan was 38 percent of the total. About 28 percent of physicians in Michigan were international medical graduates (IMGs) who graduated from a medical school in a foreign country (other than Canada) (Figure 7). Of those active patient care physicians who attended medical school in Michigan, more than two-fifths (42 percent) attended Wayne State University School of Medicine, the largest medical school in the state (Figure 8). Almost all of the active patient care physicians in Michigan completed residency/fellowship training in their principal specialty in the U.S., with approximately 59 percent in Michigan and 28 percent in another state in the U.S. or Canada (Figure 9).

Figure 7 – Location of Medical Education of Active Patient Care Physicians in Michigan, 2004



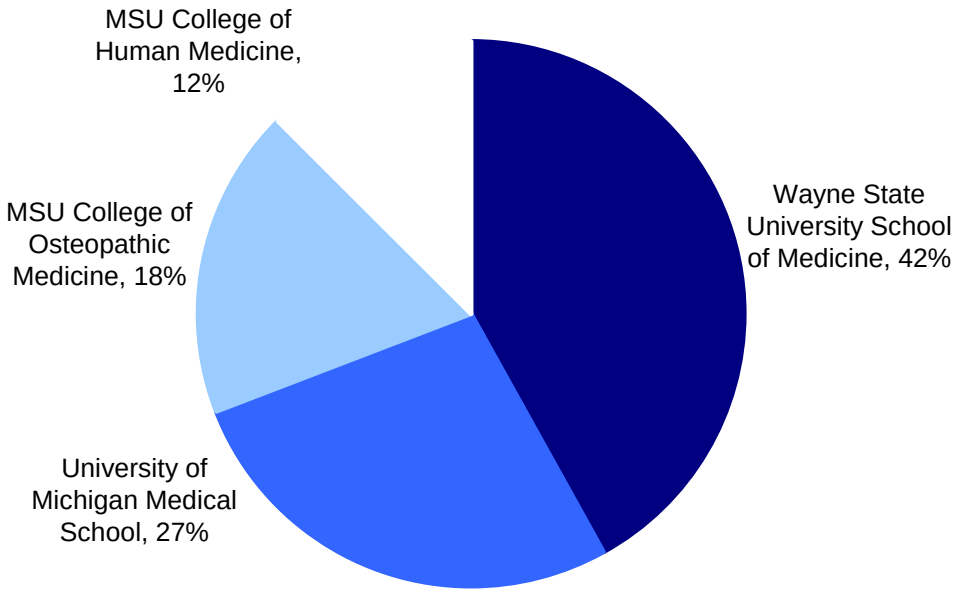
Source: American Medical Association Physician Masterfile, December 2004

Figure 8 – Location of Primary Residency Training of Active Patient Care Physicians in Michigan, 2004



Source: American Medical Association Physician Masterfile, December 2004

Figure 9 – Location of Primary Residency Training of Active Patient Care Physicians who Attended Medical School in Michigan, 2004



Source: American Medical Association Physician Masterfile, December 2004

Table 3 – Estimated Number of Medical School Graduates by Institution, 2000/01-2004/05

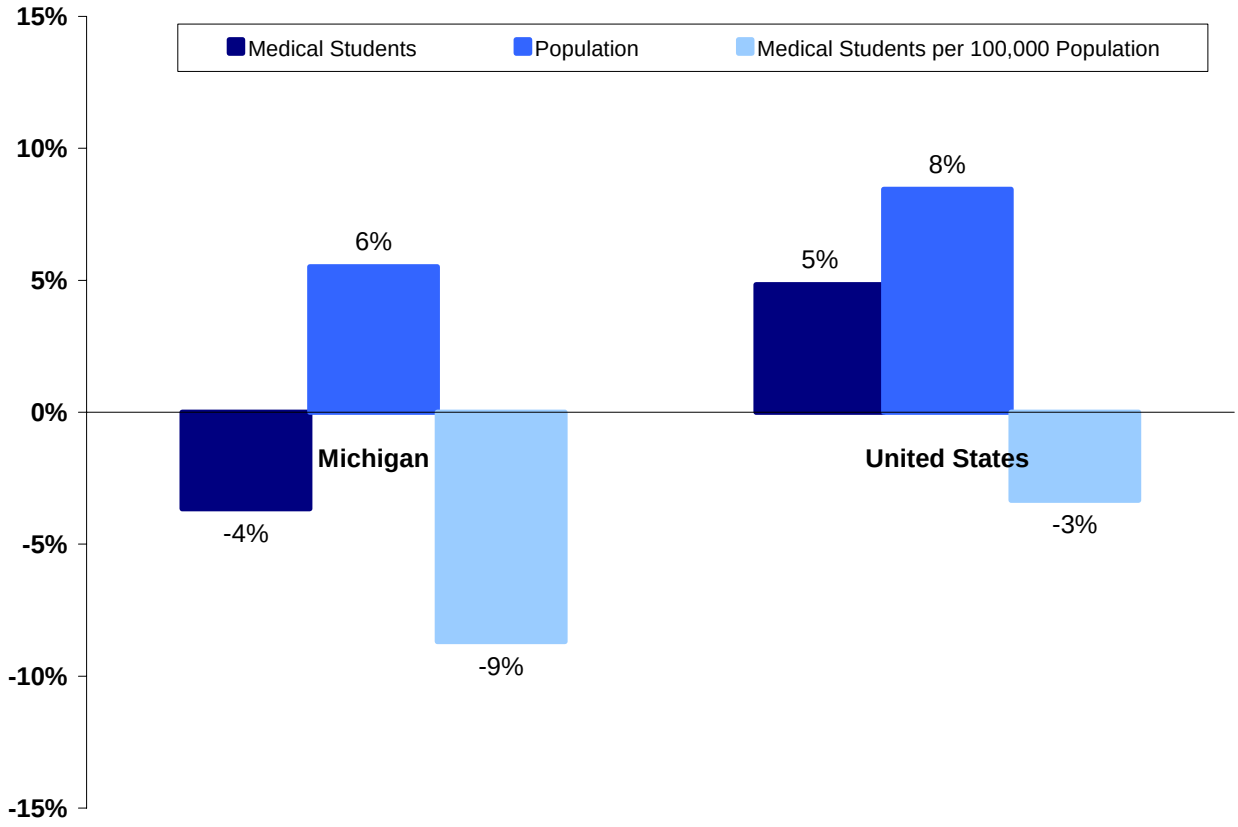
Medical School	2000/01	2001/02	2002/03	2003/04	2004/05
Michigan State University College of Osteopathic Medicine	126	119	126	129	129*
Michigan State University College of Human Medicine	103	97	111	112	101
University of Michigan Medical School	163	164	156	169	165
Wayne State University School of Medicine	236	250	231	246	239
Total	628	630	624	656	634

*estimate

Sources: Journal of the American Medical Association Medical Education Theme Issues, 2001-2005; American Association of Colleges of Osteopathic Medicine Annual Statistical Report, 2001-2004

Table 3 shows recent trends in medical school graduations at institutions across the state. Overall, the number of graduates from Michigan medical schools remained constant between the 2000/01 and 2004/05 academic years.

Figure 10 – Percent Change in Number of Medical School Students, Population and Students per 100,000 Population in Michigan and the U.S., 1994/95-2003/04



Sources: Center for Health Workforce Studies; Association of American Medical Colleges; U.S. Census Bureau

Figure 10 compares the growth in medical enrollment, population, and medical enrollment per 100,000 population between the 1994/95 and 2003/04 academic years in Michigan and the U.S. Overall, Michigan was not faring as well as the U.S. in terms of medical school enrollment keeping pace with population growth. While Michigan's population grew by 6 percent over the 10 year period of interest, medical school enrollment in the state decreased by 4 percent, leading to a net loss of nearly 9 percent in the medical student to population ratio in the state. This compared to a net loss of 3 percent in the medical students to population ratio across the country.

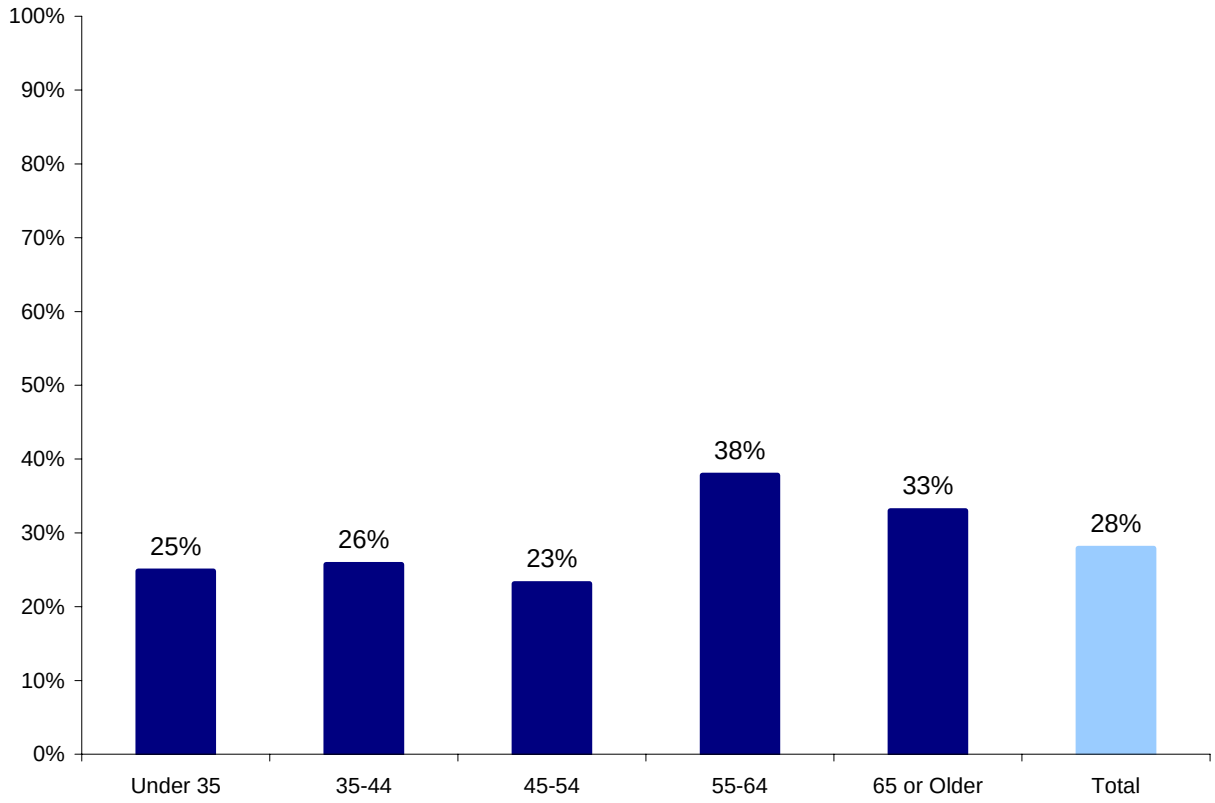
Table 4 shows the proportions of physicians who attended medical school in Michigan and those who received residency/fellowship training in their principal specialty in Michigan by principal specialty. More than half of Michigan's active patient care Dermatologists, Emergency Medicine physicians, Orthopedic Surgeons, and Ophthalmologists attended a medical school in Michigan. More than 70 percent of Michigan's active patient care General Internists, Adult Psychiatrists, and Child and Adolescent Psychiatrists completed graduate medical training in Michigan.

Table 4 – Location of Medical School and Residency Training of Active Patient Care Physicians in Michigan by Specialty, 2004

Specialty	Active Patient Care Physicians	Percent Attended Medical School in MI	Percent with Residency/ Fellowship Training in MI
Primary Care	***8,822***	***38.4%***	***63.0%***
Family Medicine	3,925	45.2%	54.6%
Internal Medicine (General)	3,426	32.6%	70.6%
Pediatrics (General)	1,472	33.9%	67.8%
Ob/Gyn	***1,342***	***45.7%***	***69.6%***
Obstetrics & Gynecology	1,276	45.6%	69.6%
Gynecology (Only)	66	48.5%	69.7%
IM Specialties	***2,167***	***25.8%***	***60.0%***
Cardiology	602	26.7%	55.4%
Endocrinology & Metabolism	97	24.7%	64.9%
Gastroenterology	264	28.4%	61.2%
Geriatrics	73	27.4%	68.5%
Infectious Disease	135	25.2%	65.7%
Medical Oncology	183	25.7%	63.6%
Nephrology	204	18.1%	61.6%
Pulmonary Disease	239	31.0%	61.1%
Rheumatology	121	28.9%	63.3%
Other Internal Medicine	251	20.7%	55.8%
Surgery (General)	***872***	***34.4%***	***65.5%***
Surgery Specialties	***2,499***	***44.8%***	***49.1%***
Neurosurgery	147	28.1%	39.0%
Ophthalmology	585	54.2%	50.1%
Orthopedics	625	53.4%	50.9%
Otolaryngology	258	42.6%	44.2%
Plastic Surgery	172	37.8%	58.1%
Thoracic Surgery	140	20.7%	35.0%
Urology	301	41.5%	53.2%
Other Surgery Specialties	271	36.8%	49.8%
Facility Based	***2,675***	***37.7%***	***52.8%***
Anesthesiology	974	39.5%	44.9%
Pathology	506	28.9%	49.0%
Radiology	1,196	40.1%	60.9%
Psychiatrists	***1,241***	***36.3%***	***70.5%***
Psychiatry - Adult	1,048	36.4%	70.2%
Psychiatry - Child & Adolescent	193	35.8%	71.6%
Other	***3,033***	***43.2%***	***62.1%***
Allergy & Immunology	150	34.0%	61.3%
Dermatology	293	54.5%	65.4%
Emergency Medicine	1,095	50.5%	69.7%
Neurology	396	27.3%	49.2%
Pediatrics Subspecialties	458	31.9%	61.6%
Physical Medicine & Rehab	300	54.8%	63.3%
Prev Med/Occ Med/Public Hlth	168	42.3%	52.4%
Other	173	33.3%	46.6%
Total	***23,769***	***38.2%***	***58.5%***

Note: Total column does not sum to total due to missing specialty information in the AMA Masterfile.
Source: American Medical Association Physician Masterfile, December 2004

Figure 11 – Percentage of International Medical School Graduates of Active Patient Care Physicians in Michigan by Age, 2004



Source: American Medical Association Physician Masterfile, December 2004

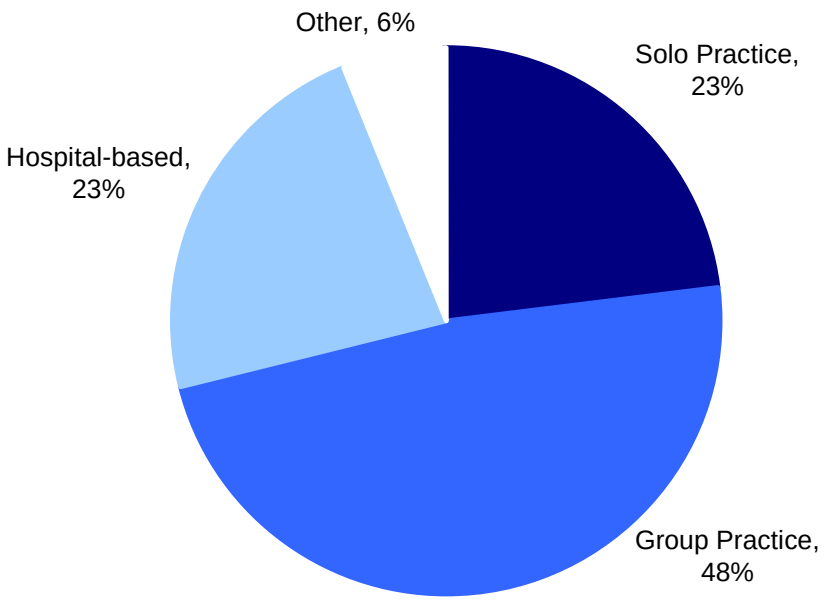
Additionally, there were significant variations in the proportion of IMGs by specialty, with two specialties, Nephrology and Geriatrics, having more than 50 percent. Several specialties were made up of fewer than 10 percent IMGs, including Dermatology, Emergency Medicine, Ophthalmology, and Orthopedics (Table 2).

International medical graduates made up a larger percentage of the older active patient care physician workforce in 2004 (Figure 11). While comprising 28 percent of the overall active patient care physician workforce, IMGs made up more than one-third of the active patient care physicians age 50 and older in 2004.

Practice Setting

Group practices were the most frequent principal practice settings of active patient care physicians in Michigan in 2004, with 48 percent of physicians practicing in group settings (Figure 12). Hospital-based and solo practice settings were the next most frequent, with 23 percent of physicians practicing in such settings. Very few patient care physicians in Michigan (6 percent) practiced in other settings.

Figure 12 – Principal Practice Setting of Active Patient Care Physicians in Michigan, 2004



Source: American Medical Association Physician Masterfile, December 2004

Practice Specialty

In 2004, more than one-third of the active patient care physicians in Michigan practiced one of the primary care disciplines as their principal specialty. Family Medicine, General Internal Medicine, and General Pediatrics made up 39 percent of the active patient care physicians in the state as their principal specialty. More patient care physicians in Michigan were specialists in Family Medicine than any other specialty. Almost 4,000 active patient care physicians (17 percent of the total physician supply) indicated that Family Medicine was their principal specialty. This was followed by General Internal Medicine (14 percent), General Pediatrics (8 percent), and Adult Psychiatry (6 percent). Table 5 presents the estimated numbers and percentages of active patient care physicians by specialty in Michigan in 2004.

Table 5 – Principal Specialties of Active Patient Care Physicians in Michigan, 2004

Specialty	Active Patient Care Physicians	Percent of Active Patient Care Physicians in MI
Primary Care	***8,822***	***38.9%***
Family Medicine	3,925	17.3%
Internal Medicine (General)	3,426	15.1%
Pediatrics (General)	1,472	6.5%
Ob/Gyn	***1,342***	***5.9%***
Obstetrics & Gynecology	1,276	5.6%
Gynecology (Only)	66	0.3%
IM Specialties	***2,167***	***9.6%***
Cardiology	602	2.7%
Endocrinology & Metabolism	97	0.4%
Gastroenterology	264	1.2%
Geriatrics	73	0.3%
Infectious Disease	135	0.6%
Medical Oncology	183	0.8%
Nephrology	204	0.9%
Pulmonary Disease	239	1.1%
Rheumatology	121	0.5%
Other Internal Medicine	251	1.1%
Surgery (General)	***872***	***3.9%***
Surgery Specialties	***2,499***	***11.0%***
Neurosurgery	147	0.6%
Ophthalmology	585	2.6%
Orthopedics	625	2.8%
Otolaryngology	258	1.1%
Plastic Surgery	172	0.8%
Thoracic Surgery	140	0.6%
Urology	301	1.3%
Other Surgery Specialties	271	1.2%
Facility Based	***2,675***	***11.8%***
Anesthesiology	974	4.3%
Pathology	506	2.2%
Radiology	1,196	5.3%
Psychiatrists	***1,241***	***5.5%***
Psychiatry - Adult	1,048	4.6%
Psychiatry - Child & Adolescent	193	0.9%
Other	***3,033***	***13.4%***
Allergy & Immunology	150	0.7%
Dermatology	293	1.3%
Emergency Medicine	1,095	4.8%
Neurology	396	1.7%
Pediatrics Subspecialties	458	2.0%
Physical Medicine & Rehab	300	1.3%
Prev Med/Occ Med/Public Hlth	168	0.7%
Other	173	0.8%
Total	***23,769***	

Note: Total column does not sum to total due to missing specialty information in the AMA Masterfile.
Source: American Medical Association Physician Masterfile, December 2004

Potential Shortage Areas

In 2004, the East Central region had the lowest number of active patient care physicians per 100,000 population (92 per 100,000). The Ann Arbor Area had the highest number of active patient care physicians per 100,000 population (449 per 100,000). As is evident in Table 6, this five-fold difference means there were several regions that fell well below established benchmarks of adequate physician supply. Moreover, these disparities were important to consider when interpreting regional supply and demand forecasts.

In the mid-1990s, the Council on Graduate Medical Education developed physician supply recommendations. Based on the results of a meta-analysis of a handful of national level physician requirement studies, the COGME recommended ratios of 60-80 primary care physicians per 100,000 population and 85-105 non-primary care physicians per 100,000 COGME 1996).

The Division of Shortage Designation of the U.S. Department of Health and Human Services formally defined Health Professional Shortage Areas (HPSAs). One of the key factors in the assessment of whether an area, population, or facility qualifies as a HPSA was the population-to-provider ratio.[2] Thus, with the available data on physicians, it was possible to make some crude assessments of the potential designation of areas of Michigan as HPSAs.

Table 6 provides the active patient care physicians and primary care physicians per 100,000 resident population by county. As shown in the table, a number of counties in the state fell below the provider-to-population ratios recommended by the COGME and the federal Division of Shortage Designation. While this method of identifying shortage areas was crude, it did indicate there were certain areas of the state that deserved more attention than others in terms of the current physician supply.

[2] Other key factors for designating primary care HPSAs include whether the area is rational for the delivery of services; primary care services in contiguous areas are overutilized, excessively distant, or otherwise inaccessible; characteristics of the population, such as low-income, Medicaid eligible, migrant or season farm workers, and the homeless; as well as a host of other factors. The population to primary care ratio for designation of a HPSA is 3,500:1 (about 28.6 providers per 100,000 population), but may be as low as 3,000:1 (about 33.3 providers per 100,000 population) in a special population HPSA.

Table 6 – Estimated Numbers of Active Patient Care Physicians in Michigan by County, 2004

Region/County	Active Patient Care Physicians	Population	Active Patient Care Physicians/ 100,000 Population	Primary Care* Physicians/ 100,000 Population	Non-Primary Care Physicians/ 100,000 Population
Ann Arbor Area	***2,359***	***524,869***	***449***	***146***	***293***
Livingston	142	180,335	79	50***	28***
Washtenaw	2,217	344,534	643	195	432
Detroit Area	***11,454***	***4,257,928***	***269***	***113***	***141***
Macomb	1,632	829,441	197	94	86
Oakland	4,715	1,223,341	385	153	209
St. Clair	251	172,325	146	62	79***
Wayne	4,856	2,032,822	239	101	127
East Central	***138***	***149,667***	***92***	***55******	***32******
Arenac	11	17,142	64	46***	17***
Clare	28	31,510	89	64	19***
Gladwin	17	26,892	63	44***	18***
Iosco	27	26,596	102	53***	41***
Ogemaw	32	21,693	148	65	74***
Roscommon	23	25,834	89	51***	31***
Flint Area	***1,165***	***514,535***	***226***	***115***	***94***
Genesee	1,067	441,769	242	123	100
Shiawassee	98	72,766	135	62	62***
Grand Rapids-Muskegon	***2,315***	***1,177,624***	***197***	***84***	***105***
Allegan	57	114,034	50	34***	16***
Kent	1,584	602,121	263	104	148
Muskegon	338	176,816	191	90	94
Oceana	20	28,808	69	41***	21***
Ottawa	315	255,845	123	62	57***
Jackson Area	***535***	***461,751***	***116***	***52******	***60******
Hillsdale	46	47,162	98	44***	42***
Jackson	225	161,917	139	59***	78***
Lenawee	117	101,108	116	51***	63***
Monroe	148	151,563	98	49***	44***
Kalamazoo-Battle Creek	***1,201***	***551,258***	***218***	***93***	***120***
Barry	43	59,662	72	40***	29***
Branch	57	46,672	122	52***	54***
Calhoun	297	139,748	213	98	112
Kalamazoo	745	241,903	308	120	183
St. Joseph	59	63,273	93	57***	37***

Table 6 – Estimated Numbers of Active Patient Care Physicians in Michigan by County, 2004 (cont.)

Region/County	Active Patient Care Physicians	Population	Active Patient Care Physicians/ 100,000 Population	Primary Care* Physicians/ 100,000 Population	Non-Primary Care Physicians/ 100,000 Population
Lansing Area	***1,131***	***459,410***	***246***	***109***	***119***
Clinton	37	69,325	53	45***	7***
Eaton	103	107,873	95	62	31***
Ingham	990	282,211	351	144	181
Northeast	***216***	***142,291***	***152***	***79***	***64******
Alcona	3	11,571	26	26**	0***
Alpena	87	30,542	285	118	160
Cheboygan	42	27,114	155	85	55***
Crawford	25	14,775	169	109	54***
Montmorency	8	10,431	77	67	0***
Oscoda	2	9,288	22	21**	0***
Ostego	41	24,356	168	83	69***
Presque Isle	9	14,214	63	35***	21***
Northwest	***759***	***296,814***	***256***	***108***	***143***
Antrim	15	24,576	61	41***	16***
Benzie	18	17,520	103	69	34***
Charlevoix	37	26,748	138	98	34***
Emmet	170	33,380	509	150	354
Grand Traverse	386	83,008	465	179	276
Kalkaska	8	17,257	46	35***	12***
Leelanau	12	22,232	54	27**	23***
Manistee	35	25,168	139	68	68***
Missaukee	4	15,333	26	20**	7***
Wexford	75	31,592	237	130	102
Saginaw-Thumb	***1,113***	***630,791***	***176***	***82***	***89***
Bay	191	108,911	175	77	90
Huron	47	34,766	135	80	54***
Lapeer	100	92,029	109	61	46***
Midland	178	84,175	211	104	105
Saginaw	519	207,975	250	107	141
Sanilac	37	44,595	83	54***	22***
Tuscola	42	58,341	72	39***	29***
Southwest Michigan	***364***	***290,564***	***125***	***67***	***58******
Berrien	270	161,534	167	80	86
Cass	22	51,256	43	23**	19***
Van Buren	72	77,775	93	67	24***

Table 6 – Estimated Numbers of Active Patient Care Physicians in Michigan by County, 2004 (cont.)

Region/County	Active Patient Care Physicians	Population	Active Patient Care Physicians/ 100,000 Population	Primary Care* Physicians/ 100,000 Population	Non-Primary Care Physicians/ 100,000 Population
Upper Peninsula	***578***	***312,418***	***185***	***92***	***89***
Alger	10	9,677	103	41***	51***
Baraga	9	8,654	104	93	11***
Chippewa	55	38,463	143	81	60***
Delta	60	38,055	158	87	64***
Dickinson	74	27,114	273	107	158
Gogebic	26	16,885	154	89	66***
Houghton	62	35,267	176	99	74***
Iron	11	12,480	88	48***	32***
Keweenaw	0	2,185	0	0**	0***
Luce	10	6,792	147	103	44***
Mackinac	15	11,287	133	124	9***
Marquette	217	64,325	337	135	196
Menominee	13	24,961	52	32**	20***
Ontonagon	5	7,474	67	40***	27***
Schoolcraft	12	8,799	136	91	34***
West Central	***439***	***388,948***	***113***	***63***	***45******
Gratiot	65	42,070	155	88	64***
Ionia	45	63,882	70	53***	16***
Isabella	94	63,985	147	64	74***
Lake	5	11,790	42	34***	8***
Mason	55	28,850	191	80	104
Mecosta	42	42,068	100	67	31***
Montcalm	78	63,137	124	75	42***
Newaygo	39	49,508	79	42***	32***
Osceola	17	23,658	72	46***	25***
Total	***23,769***	***10,158,867***	***234***	***101***	***122***

** In this table, primary care includes: General/Family Medicine, General Internal Medicine, General Pediatrics, and Obstetrics and Gynecology. The inclusion of Obstetrics and Gynecology was necessary to match the federal definition of primary care.*
***Falls below HPSA threshold for designation as a shortage area.*
****Falls below COGME recommended physician to population ratios.*
Note: The sum of primary care physicians and non-primary care physicians may not equal all active patient care physicians due to rounding and missing practice specialty information in the AMA Masterfile.
Sources: American Medical Association Physician Masterfile, December 2004; U.S. Census Bureau; Woods and Poole 2005

Chapter 5: Profile of Medical Education and Training in Michigan, 2005

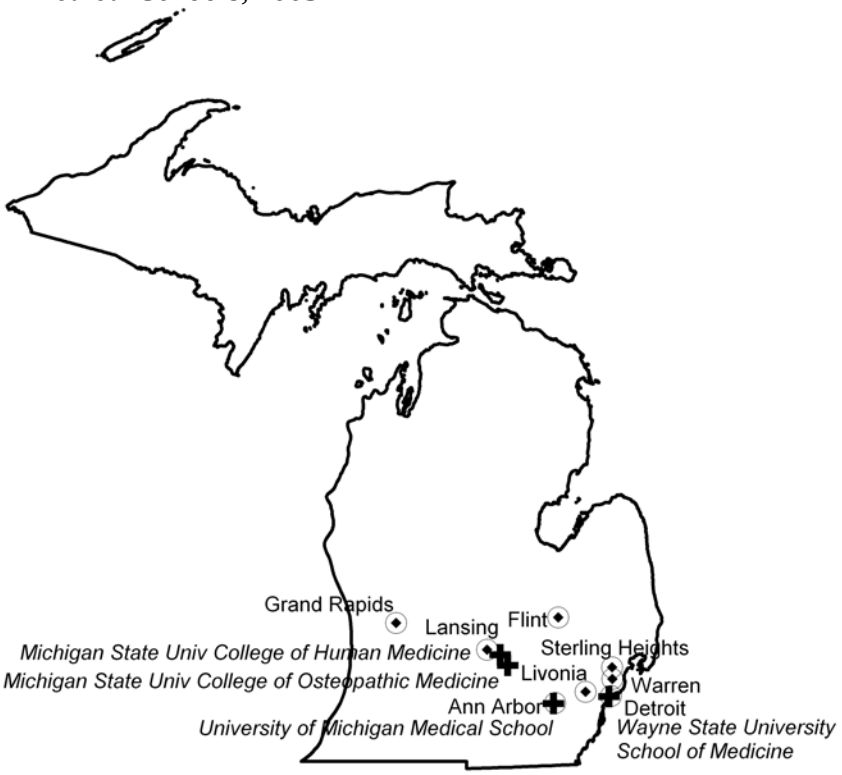
Introduction

For most states, the two main sources of physicians are physicians who attended medical school in the state and those who obtained graduate medical training in the state. This chapter presents data on both of these sources in Michigan. Understanding the current status and historical trends in medical education and training is a requirement for understanding future changes in the supply of physicians in the state.

Undergraduate Medical Education

Currently there are four medical schools in Michigan (Figure 1).[3] Table 1 presents their vital statistics. Three of the schools are allopathic medical institutions; the other is a school of osteopathic medicine. Among these four schools, a total of 2,752 medical students were enrolled during the 2004/05 academic year.

Figure 1 – Michigan Medical Schools, 2005



[3] There are plans to establish additional medical school capacity in Grand Rapids before the close of the current decade.

Table 1 – Michigan Medical School Characteristics, 2004/05

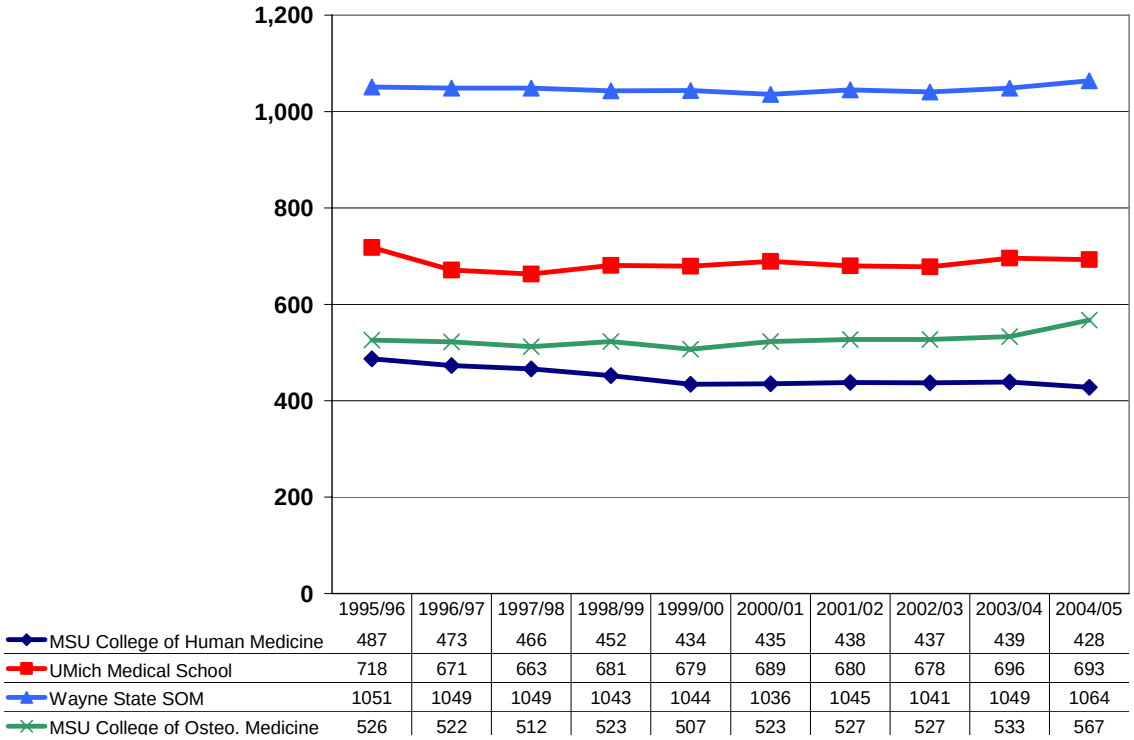
Medical School	Est.	Dean	Location	Tuition (resident/ non-resid; in 000s)	Enrollment	Affiliation
Michigan State University College of Human Medicine	1964	Marsha D. Rappley, MD	East Lansing	$23 / $49	428	Public
Michigan State University College of Osteopathic Medicine	1969	William D. Strampel, DO	East Lansing	$21 / $45	567	Public
University of Michigan Medical School	1850	James O. Woolliscroft, MD	Ann Arbor	$24 / $35	693	Public
Wayne State University School of Medicine	1868	Robert M. Mentzer, MD	Detroit	$20 / $39	1,064	Public

Sources: Appendix IA, Table 1. "U.S. Medical Schools with Liaison Committee on Medical Education (LCME)-Accredited Programs. 2004-2005." Journal of the American Medical Association 294(9): 1119-1123; Singer, Allen. 2004 Annual Report on Osteopathic Medical Education. Table 14. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine.

Trends in Medical School Enrollment

The trend in enrollment between the 1995/96 academic year and the 2004/05 academic year is presented in Figure 2. Over the course of the previous ten years, while the Michigan State University College of Osteopathic Medicine increased its capacity to educate new physicians (from 526 to 587 students, 7.9 percent), the allopathic schools, with the exception of Wayne State University School of Medicine, experienced a slight decrease in their capacity.

Figure 2 – Historical Enrollment in Michigan Medical Schools, 1995/96 – 2004/05



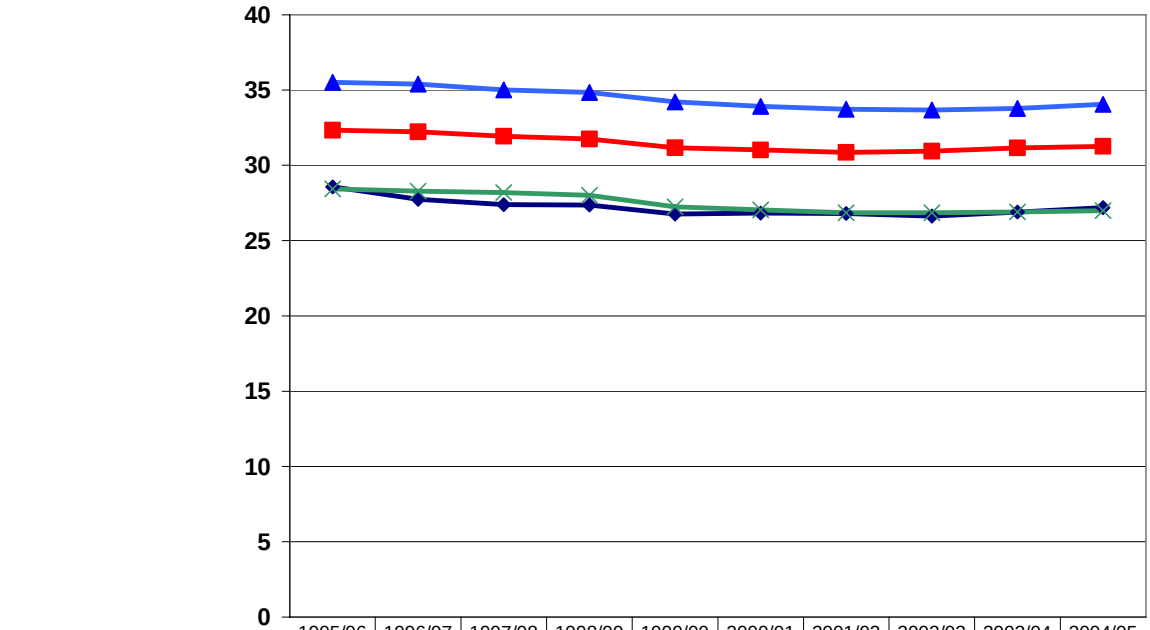
	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
MSU College of Human Medicine	487	473	466	452	434	435	438	437	439	428
UMich Medical School	718	671	663	681	679	689	680	678	696	693
Wayne State SOM	1051	1049	1049	1043	1044	1036	1045	1041	1049	1064
MSU College of Osteo. Medicine	526	522	512	523	507	523	527	527	533	567

Sources: Appendix IA. Table 2. Journal of the American Medical Association Medical Education Theme Issues, 1997-2005. 1997-2004 Annual Reports on Osteopathic Medical Education. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine.

Michigan State University College of Human Medicine experienced a decline 487 students in 1995/96 to 428 in 2004/05, a 12 percent decline; whereas University of Michigan School of Medicine declined from 718 students in 1995/96 to 693 in 2004/05, a decline of 3 percent. These losses were great enough to erase the increases in enrollment by the osteopathic school, and for the decade, Michigan as a whole experienced a 1 percent (30 students) decline in medical school enrollment.

To put these trends into perspective, it was helpful to compare how the state fared over the same period relative to its neighbors, region of the country, and finally, the nation as a whole (Figure 3). Taking into account the changes in population across all of the states, Michigan experienced a slightly greater decline in medical school enrollment compared to its immediate neighbors in the East North Central division (Illinois, Indiana, Ohio, and Wisconsin) over the past decade, moving from 28.6 enrolled medical students per 100,000 population to 27.2 (a 5 percent decline) compared to a 3 percent decline from 32.3 to 31.3 in the East North Central division. A similar comparison can be made between Michigan and the entire Midwest region (including Iowa, Kansas, Minnesota Missouri, Nebraska, North Dakota, and South Dakota in addition to the other states mentioned above) which experienced a 4 percent decline over the same time period. As a whole, the U.S. experienced a decline of 5 percent, very similar to the Michigan experience.

Figure 3 – Historical Medical School Enrollment per 100,000 Population in Michigan, the North East Central Region, the Midwest, and the U.S., 1995/96 – 2004/05



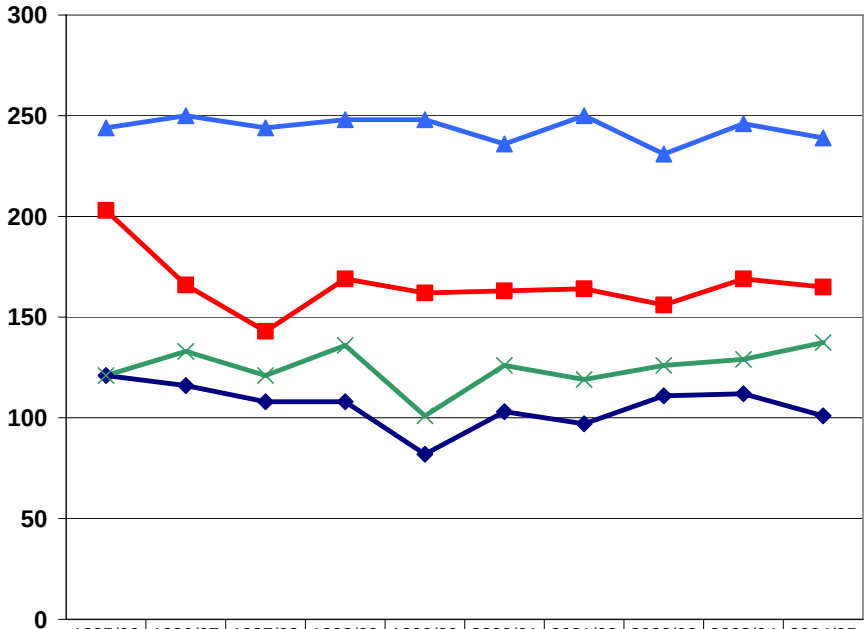
	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Michigan	28.6	27.7	27.4	27.4	26.8	26.8	26.8	26.6	26.9	27.2
East North Central Division	32.3	32.2	31.9	31.7	31.2	31.0	30.9	30.9	31.2	31.3
Midwest Region	35.5	35.4	35.0	34.8	34.2	33.9	33.7	33.7	33.8	34.1
US	28.4	28.3	28.2	28.0	27.2	27.0	26.8	26.9	26.9	27.0

Sources: Appendix IA. Table 2. Journal of the American Medical Association Medical Education Theme Issues, 1997-2005. 1997-2004 Annual Reports on Osteopathic Medical Education. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine.

Trends in Medical School Graduation

The trend in enrollment between the 1995/96 academic year and the 2004/05 academic year is presented in Figure 4. In the past decade, Michigan State University College of Human Medicine and the University of Michigan Medical School experienced significant declines in the number of students they were graduating annually, 17 percent and 19 percent, respectively. Wayne State School of Medicine also experienced a decline, but it was much smaller (2 percent). On the other hand, Michigan State University College of Osteopathic Medicine experienced a significant increase in the number of students graduating from the school (13 percent between 1995/96 and 2004/05). On the whole, in the past decade, medical schools in Michigan experienced a decline of 7 percent in graduates, amounting to about 50 fewer annual medical school graduates in 2004/05 compared to 1995/96.

Figure 4 – Historical Graduations from Michigan Medical Schools, 1995/96 – 2004/05

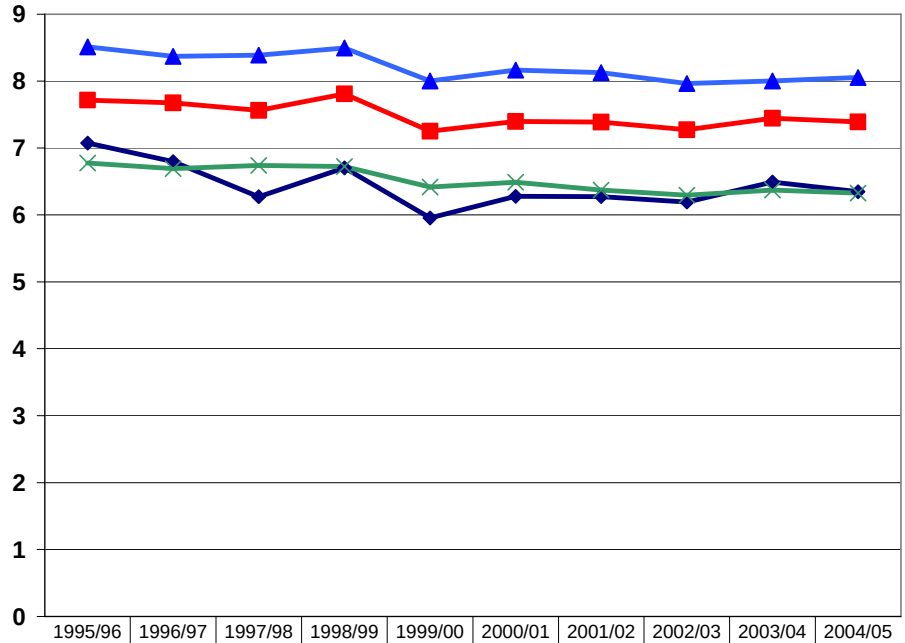


	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
MSU College of Human Medicine	121	116	108	108	82	103	97	111	112	101
UMich Medical School	203	166	143	169	162	163	164	156	169	165
Wayne State SOM	244	250	244	248	248	236	250	231	246	239
MSU College of Osteo. Medicine	121	133	121	136	101	126	119	126	129	137

Sources: Appendix IA. Table 2. Journal of the American Medical Association Medical Education Theme Issues, 1997-2005. 1997-2004 Annual Reports on Osteopathic Medical Education. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine.

Again some comparisons were instructive (Figure 5). Taking into account the changes in population across all of the states, Michigan experienced a slightly greater decline in medical school graduations compared to its immediate neighbors in the East North Central division over the past decade, moving from 7.1 medical graduates per 100,000 population to 6.3 (a 10 percent decline) compared to a 4 percent decline from 7.7 to 7.4 in the East North Central division. A similar comparison can be made between Michigan and the entire Midwest region which experienced a 5 percent decline over the same time period. As a whole, the U.S. experienced a decline of 7 percent, a smaller decline than Michigan experienced during the same period.

Figure 5 – Historical Medical School Graduations per 100,000 Population in Michigan, the North East Central Region, the Midwest, and the U.S., 1995/96 – 2004/05



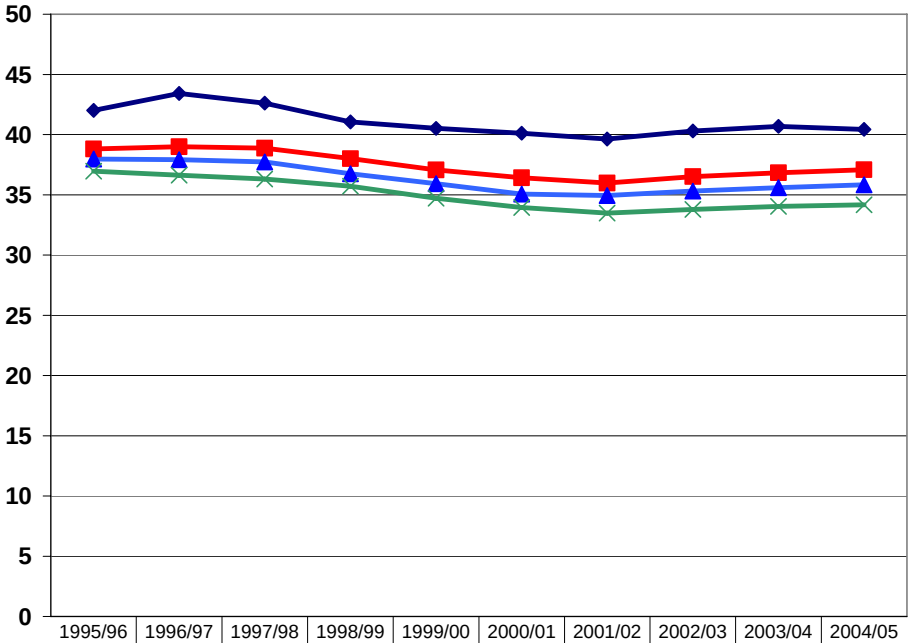
	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Michigan	7.1	6.8	6.3	6.7	6.0	6.3	6.3	6.2	6.5	6.3
East North Central Division	7.7	7.7	7.6	7.8	7.3	7.4	7.4	7.3	7.4	7.4
Midwest Region	8.5	8.4	8.4	8.5	8.0	8.2	8.1	8.0	8.0	8.1
US	6.8	6.7	6.7	6.7	6.4	6.5	6.4	6.3	6.4	6.3

Sources: Appendix IA. Table 2. Journal of the American Medical Association Medical Education Theme Issues, 1997-2005. 1997-2004 Annual Reports on Osteopathic Medical Education. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine; U.S. Census Bureau.

Graduate Medical Training

The other distinct source of physicians in the state is the product of graduate medical training efforts there. In the 2004/05 academic year, there were 4092 physicians in the 315 ACGME-accredited allopathic residency and fellowship programs throughout Michigan. That number remained remarkably consistent over time. Moreover, when compared to its neighboring state and the larger Midwest region, Michigan fared better over the previous decade. Taking population growth into account, between the 1995/96 academic year and the 2004/05 academic year, in Michigan the number of residents and fellows in training decreased by 4 percent (from 42.0 per 100,000 population to 40.4) compared to 5 percent in the East North Central division, 6 percent in the Midwest, and 8 percent nationally (Figure 6).

Figure 6 – Historical Number of Residents and Fellows in Training per 100,000 Population in Michigan, the North East Central Region, the Midwest, and the U.S., 1995/96 – 2004/05



	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Michigan	42.0	43.4	42.6	41.0	40.5	40.1	39.6	40.3	40.7	40.4
East North Central Division	38.8	39.0	38.9	38.0	37.1	36.4	36.0	36.5	36.8	37.1
Midwest Region	38.0	37.9	37.7	36.7	35.9	35.1	34.9	35.3	35.6	35.8
US	37.0	36.6	36.3	35.7	34.7	34.0	33.5	33.8	34.0	34.2

Sources: Appendix II. Table 2. Journal of the American Medical Association Medical Education Theme Issues, 1997-2005.

While the total number of residents in training did not change noticeably over time, the composition of the residents in training did, and in some cases, dramatically (Table 2). In terms of the specialties in which residents and fellows were training, there were 10 percent fewer residents/fellows training in primary care specialties in 2004/05 than in 1995/96. Nationally, the numbers of primary care residents/fellows were about equal over the time period. Hospital-based specialties experienced the largest growth, with the number of anesthesiology residents increasing by almost 75 percent and emergency medicine residents increasing by one-third over the course of the decade. This trend was generally consistent with the trend at the national level, although the increases experienced in Michigan were far greater than those nationally. While most surgical residencies in the state declined slightly, plastic surgery and urology experienced increases in the number of residents/fellows in training, with plastic surgery nearly doubling and urology increasing by 11 percent. The same trend was evident nationally, except for urology, where there was a decline rather than an increase; and the increase in plastic surgery nationally while large (25 percent) was significantly smaller than in the state. Internal medicine subspecialties also experienced a large increase in residents in the state and nationally (26 percent and 9 percent, respectively). Finally, while the number of residents/fellows training in psychiatry declined by 7 percent nationally, the number in Michigan increased by 29 percent between 1995/96 and 2004/05.

Table 2 – Number of Residents/Fellows by Specialty in Graduate Medical Training in Michigan, 1995/96 and 2004/05

	1995/96 Residents/ Fellows	2004/05 Residents/ Fellows	Change		
			Number	Percent	National Change
Primary Care Specialties					
Family Medicine	408	367	-41	-10%	1%
Internal Medicine	863	759	-104	-12%	1%
Obstetrics and Gynecology	254	233	-21	-8%	-6%
Pediatrics	280	249	-31	-11%	6%
Hospital-based Specialties					
Anesthesiology	76	131	55	72%	2%
Emergency Medicine	256	337	81	32%	46%
Pathology - Anatomic and Clinical	92	69	-23	-25%	-19%
Radiology - Diagnostic	203	227	24	12%	2%
Surgical Specialties and Subspecialties					
General Surgery	336	342	6	2%	-6%
Colon and Rectal Surgery	4	2	-2	-50%	2%
Neurological Surgery	31	28	-3	-10%	-2%
Ophthalmology	63	60	-3	-5%	-20%
Orthopedic Surgery	151	148	-3	-2%	7%
Otolaryngology	45	34	-11	-24%	-10%
Plastic Surgery	16	30	14	88%	25%
Thoracic Surgery	14	10	-4	-29%	-14%
Urology	38	42	4	11%	-7%
Surgical Subspecialties	23	21	-2	-9%	25%
Internal Medicine Subspecialties	237	299	62	26%	9%
Pediatric Subspecialties	60	74	14	23%	24%
Combined Specialties	161	121	-40	-25%	31%
Other Specialties and Subspecialties					
Allergy and Immunology	9	9	0	0%	0%
Dermatology	45	46	1	2%	21%
Neurology	50	48	-2	-4%	-6%
Physical Medicine and Rehabilitation	63	51	-12	-19%	-1%
Preventive Medicine	4	2	-2	-50%	-27%
Psychiatry	94	121	27	29%	-7%
Transitional Year	137	118	-19	-14%	-13%
All Others	79	114	35	44%	56%
Total	**4092**	**4092**	**0**	**0%**	**3%**

Sources: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 1995/96 and 2004/05. American Medical Association.

Origin of Physicians in Michigan Graduate Medical Training Programs
Table 3 – Origins of Physicians Training in Michigan Allopathic Graduate Medical Training Programs, 1995/96 and 2004/05

	1995/96					2004/05				
	In-state*	Out of state*	Interna-tional	Canada	Osteo-pathic	In-state*	Out of state*	Interna-tional	Canada	Osteo-pathic
Primary Care Specialties										
Family Medicine	37%	20%	37%	0%	6%	22%	9%	60%	0%	9%
Internal Medicine	13%	15%	69%	0%	3%	18%	18%	62%	0%	2%
Obstetrics and Gynecology	46%	47%	5%	2%	1%	31%	30%	33%	0%	5%
Pediatrics	20%	17%	56%	0%	6%	27%	18%	47%	0%	9%
Hospital-based Specialties										
Anesthesiology	37%	20%	32%	0%	11%	27%	40%	29%	0%	4%
Emergency Medicine	32%	58%	2%	0%	8%	28%	51%	13%	0%	8%
Pathology - Anatomic and Clinical	29%	22%	45%	1%	3%	25%	17%	55%	0%	3%
Radiology - Diagnostic	41%	49%	7%	2%	0%	36%	49%	11%	1%	3%
Surgical Specialties and Subspecialties										
General Surgery	35%	52%	11%	1%	0%	26%	47%	24%	1%	1%
Colon and Rectal Surgery	25%	75%	0%	0%	0%	0%	50%	50%	0%	0%
Neurological Surgery	6%	71%	19%	3%	0%	32%	61%	7%	0%	0%
Ophthalmology	35%	49%	16%	0%	0%	35%	57%	7%	0%	2%
Orthopedic Surgery	32%	67%	1%	0%	0%	32%	68%	1%	0%	0%
Otolaryngology	27%	69%	4%	0%	0%	26%	74%	0%	0%	0%
Plastic Surgery	6%	69%	19%	6%	0%	30%	60%	10%	0%	0%
Thoracic Surgery	0%	86%	14%	0%	0%	0%	90%	10%	0%	0%
Urology	21%	74%	5%	0%	0%	29%	55%	14%	0%	2%
Surgical Subspecialties	22%	61%	17%	0%	0%	14%	76%	10%	0%	0%
Internal Medicine Subspecialties	17%	22%	57%	0%	4%	16%	31%	50%	0%	2%
Pediatric Subspecialties	8%	30%	55%	3%	3%	9%	35%	47%	4%	4%
Combined Specialties	37%	35%	24%	0%	4%	29%	39%	29%	0%	3%
Other Specialties and Subspecialties										
Allergy and Immunology	22%	33%	44%	0%	0%	22%	56%	22%	0%	0%
Dermatology	29%	60%	9%	2%	0%	35%	59%	4%	2%	0%
Neurology	14%	28%	50%	0%	8%	13%	38%	42%	0%	8%
Physical Medicine and Rehabilitation	35%	30%	11%	0%	24%	20%	29%	16%	0%	35%
Preventive Medicine	0%	50%	50%	0%	0%	50%	0%	50%	0%	0%
Psychiatry	33%	17%	38%	0%	12%	32%	21%	31%	0%	17%
Transitional Year	41%	15%	42%	1%	1%	40%	34%	17%	0%	9%
All Others	24%	46%	22%	0%	9%	18%	32%	43%	0%	6%
Total	**28%**	**33%**	**35%**	**1%**	**4%**	**25%**	**33%**	**36%**	**0%**	**5%**

** In-state and Out-of-state refer to allopathic schools only.*

Sources: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 1995/96 and 2004/05. American Medical Association.

The pool from which fellows and residents are drawn is an important piece of information in evaluating graduate medical training. In Michigan, almost three-quarters of those in allopathic graduate training programs received their undergraduate medical education outside the state (Table 3). In 2004/05, the greatest reliance on physicians from medical schools outside the state was found in the surgical specialties and subspecialties, with more than half of the residents and fellows in those programs having attended a medical outside Michigan. The hospital-based specialties had the greatest concentration of residents and fellows from Michigan medical schools. The primary care specialties were most reliant on international medical graduates, with 55 percent of residents and fellows in primary care specialties having attended a medical school outside the U.S. and Canada.

Over time, the reliance on physicians who graduated from medical schools outside Michigan has increased slightly, moving from 72 percent to 75 percent since 1995/96. The specialties groups with the greatest change in their reliance on physicians from medical schools outside the state were the primary care specialties and the hospital-based specialties. In both of these groups, the most significant component of this observed change was the increase in reliance on international medical graduates.

Demographics of Graduate Medical Training in Michigan

Demographically, the composition of physicians training at the graduate level in Michigan has changed in ways similar to those training in other states. In 2004/05, women made up 41 percent of the physicians in graduate medical training in the state (Table 4) compared to 43 percent of the physicians in graduate medical training in the U.S. as a whole. Over time, the percentage of females among physicians in graduate medical training has increased. In 1995/96, women made up 34 percent of the physicians in graduate medical training in both Michigan and in the country as a whole.

Among physicians training at the graduate level in Michigan, women made up a larger proportion of those training in the primary care specialties than men. This was the case in each of the primary care specialties with the exception of general internal medicine. The gap was greatest in obstetrics/gynecology and pediatrics, where more than 70 percent of the trainees are women. On the other hand, men far outnumbered women in the surgical specialties and subspecialties. Over time, little has changed in the gender composition across specialties among physicians training at the graduate level in Michigan. With few exceptions, notably colon and rectal surgery where in 2004/05 women made up 50 percent of the trainees, the gender composition has remained very close to what it was in 1995/96.

In terms of race and ethnicity, non-Hispanic White physicians were predominant among physicians training at the graduate level in Michigan making up slightly less than half (49 percent) of the trainees in 2004/05 (Table 5). Non-Hispanic White physicians were most represented in surgical specialties and subspecialties as well as in emergency medicine. Asian-American physicians made up just over one-quarter (28 percent) of the physicians training at the graduate level. Underrepresented minority physicians (Blacks/African-Americans and Hispanics/Latinos) made up just 8 percent of the physicians training at the graduate level in the state. This underrepresentation compared to about 18 percent (in 2003) of the general population

of the state comprised of Blacks/African-Americans and Hispanics/Latinos. Underrepresented minorities had the highest level of representation in obstetrics and gynecology (19 percent), pediatrics (18 percent), and general surgery (14 percent).

Between the 1995/96 and 2004/05 academic years, the most noticeable trend in racial/ethnic make-up of the physicians training at the graduate level in Michigan was an increase in the representation of Asian-American trainees and subsequent decrease in the representation of non Hispanic White trainees. This closely follows the trend at the national level over the same time period.

Table 4 – Gender Distribution of Physicians Training in Michigan Allopathic Graduate Medical Training Programs, 1995/96 and 2004/05

	1995/96		2004/05	
	Male	**Female**	**Male**	**Female**
Primary Care Specialties				
Family Medicine	53%	47%	43%	57%
Internal Medicine	68%	32%	59%	41%
Obstetrics and Gynecology	37%	63%	24%	76%
Pediatrics	45%	55%	29%	71%
Hospital-based Specialties				
Anesthesiology	79%	21%	74%	26%
Emergency Medicine	77%	23%	72%	28%
Pathology - Anatomic and Clinical	54%	46%	55%	45%
Radiology - Diagnostic	75%	25%	76%	24%
Surgical Specialties and Subspecialties				
General Surgery	83%	17%	72%	28%
Colon and Rectal Surgery	100%	0%	50%	50%
Neurological Surgery	90%	10%	86%	14%
Ophthalmology	79%	21%	67%	33%
Orthopedic Surgery	92%	8%	95%	5%
Otolaryngology	89%	11%	88%	12%
Plastic Surgery	69%	31%	87%	13%
Thoracic Surgery	100%	0%	80%	20%
Urology	84%	16%	90%	10%
Surgical Subspecialties	91%	9%	76%	24%
Internal Medicine Subspecialties	78%	22%	64%	36%
Pediatric Subspecialties	55%	45%	51%	49%
Combined Specialties	55%	45%	50%	50%
Other Specialties and Subspecialties				
Allergy and Immunology	44%	56%	67%	33%
Dermatology	47%	53%	35%	65%
Neurology	66%	34%	54%	46%
Physical Medicine and Rehabilitation	67%	33%	57%	43%
Preventive Medicine	75%	25%	50%	50%
Psychiatry	43%	57%	36%	64%
Transitional Year	66%	34%	65%	35%
All Others	71%	29%	73%	27%
Total	**66%**	**34%**	**59%**	**41%**

Sources: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 1995/96 and 2004/05. American Medical Association.

Table 5 – Race/Ethnicity Distribution of Physicians Training in Michigan Allopathic Graduate Medical Training Programs, 1995/96 and 2004/05

	1995/96					2004/05				
	White, non-Hispanic	Black/ African American	Asian American	Hispanic	Other	White, non-Hispanic	Black/ African American	Asian American	Hispanic	Other
Primary Care Specialties										
Family Medicine	60%	8%	19%	4%	10%	47%	3%	30%	1%	19%
Internal Medicine	40%	4%	33%	1%	22%	32%	4%	38%	5%	21%
Obstetrics and Gynecology	72%	13%	12%	1%	2%	53%	16%	21%	3%	7%
Pediatrics	36%	7%	22%	2%	33%	49%	5%	28%	13%	5%
Hospital-based Specialties										
Anesthesiology	71%	4%	13%	0%	12%	51%	5%	27%	3%	13%
Emergency Medicine	79%	7%	7%	1%	7%	77%	5%	10%	3%	6%
Pathology - Anatomic and Clinical	53%	8%	24%	4%	11%	37%	3%	39%	1%	20%
Radiology - Diagnostic	59%	3%	17%	0%	21%	53%	2%	28%	2%	14%
Surgical Specialties and Subspecialties										
General Surgery	67%	3%	14%	2%	14%	49%	11%	22%	3%	16%
Colon and Rectal Surgery	75%	0%	0%	25%	0%	50%	0%	50%	0%	0%
Neurological Surgery	62%	3%	10%	14%	10%	45%	7%	31%	3%	14%
Ophthalmology	77%	2%	10%	2%	10%	39%	3%	28%	2%	28%
Orthopedic Surgery	79%	3%	9%	0%	9%	72%	1%	11%	0%	16%
Otolaryngology	70%	7%	12%	0%	12%	65%	6%	18%	0%	12%
Plastic Surgery	71%	0%	12%	6%	12%	70%	0%	21%	9%	0%
Thoracic Surgery	79%	7%	7%	0%	7%	50%	10%	40%	0%	0%
Urology	48%	5%	23%	2%	23%	52%	2%	33%	0%	12%
Surgical Subspecialties	52%	4%	22%	0%	22%	76%	0%	24%	0%	0%
Internal Medicine Subspecialties	44%	3%	25%	4%	25%	50%	4%	34%	4%	9%
Pediatric Subspecialties	40%	5%	27%	0%	27%	42%	5%	43%	4%	6%
Combined Specialties	53%	13%	16%	2%	16%	50%	5%	27%	0%	17%
Other Specialties and Subspecialties										
Allergy and Immunology	17%	0%	67%	0%	17%	44%	0%	44%	0%	11%
Dermatology	60%	12%	15%	0%	13%	63%	4%	15%	4%	15%
Neurology	45%	6%	35%	2%	12%	54%	0%	30%	4%	12%
Physical Medicine and Rehabilitation	66%	7%	15%	0%	11%	56%	6%	21%	2%	15%
Preventive Medicine	50%	25%	25%	0%	0%	50%	0%	50%	0%	0%
Psychiatry	50%	13%	16%	1%	20%	49%	7%	25%	1%	17%
Transitional Year	43%	10%	18%	0%	29%	42%	3%	15%	0%	40%
All Others	61%	8%	19%	0%	13%	45%	4%	39%	3%	8%
Total	**55%**	**6%**	**20%**	**2%**	**17%**	**49%**	**5%**	**28%**	**3%**	**15%**

Sources: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 1995/96 and 2004/05. American Medical Association.

Production of New Physicians in Michigan

In the 2004/05 academic year, 1,223 physicians training at the graduate level in Michigan completed a training program (Table 6).[4] This represented an increase of 60 physicians (5 percent) compared to the 1995/96 academic year. This increase was also slightly higher than a similar increase at the national level of 3 percent. The greatest numbers of physicians completed training in general internal medicine (237), internal medicine subspecialties (135), and family medicine (134). For specialty groups, pediatric subspecialties (56 percent) and hospital-based specialties (35 percent) experienced the greatest growth in production. In terms of growth or decline in particular specialties, the greatest growth was observed in the number physicians completing training in plastic surgery (200 percent), emergency medicine (59 percent), and anesthesiology (36 percent). With the exception of emergency medicine, these rates of change were far greater than the change observed at the national level in these specialties.

On the other hand, the production of new primary care physicians was essentially flat over the time period. Moreover, the number of physicians completing in a handful of specialties declined over the time period. Preventive medicine, neurological surgery, neurology, urology, obstetrics and gynecology, orthopedic surgery, and general internal medicine experienced declines ranging from 50 percent in preventive medicine to 4 percent in general internal medicine. These observed declines were relatively similar to the changes at the national level.[5]

[4] This number does not include physicians who completed a preliminary year in a program.
[5] Individual specialty-level change was difficult to compare because there were so few program completers in many specialties.

Table 6 – Number of Physicians Completing Allopathic Graduate Medical Training in Michigan by Specialty, 1995/96 and 2004/05

	1995/96 Residents/ Fellows Completing Training	2004/05 Residents/ Fellows Completing Training	Change Number	Change Percent	National Change
Primary Care Specialties					
Family Medicine	119	134	15	13%	27%
Internal Medicine	246	237	-9	-4%	2%
Obstetrics and Gynecology	57	53	-4	-7%	-11%
Pediatrics	78	85	8	10%	6%
Hospital-based Specialties					
Anesthesiology	28	38	10	36%	-16%
Emergency Medicine	59	94	35	59%	63%
Pathology - Anatomic and Clinical	13	13	0	0%	-13%
Radiology - Diagnostic	45	51	6	13%	-9%
Surgical Specialties and Subspecialties					
General Surgery	48	51	3	6%	-2%
Colon and Rectal Surgery	3	3	0	0%	-5%
Neurological Surgery	7	5	-2	-29%	-8%
Ophthalmology	20	20	0	0%	-26%
Orthopedic Surgery	32	30	-2	-6%	-6%
Otolaryngology	10	11	1	10%	-16%
Plastic Surgery	4	12	8	200%	-14%
Thoracic Surgery	4	5	1	25%	-13%
Urology	11	10	-1	-9%	-11%
Surgical Subspecialties	13	14	1	8%	34%
Internal Medicine Subspecialties	113	135	22	19%	6%
Pediatric Subspecialties	18	28	10	56%	16%
Combined Specialties	31	33	2	6%	134%
Other Specialties and Subspecialties					
Allergy and Immunology	6	6	0	0%	-14%
Dermatology	13	12	-1	-8%	11%
Neurology	18	13	-5	-28%	-6%
Physical Medicine and Rehabilitation	16	16	0	0%	-4%
Preventive Medicine	4	2	-2	-50%	140%
Psychiatry	19	24	5	26%	-14%
Transitional Year	81	0	-81	-100%	-100%
All Others	47	88	41	87%	78%
Total	**1,163**	**1,223**	**60**	**5%**	**3%**

Sources: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 1995/96 and 2004/05. American Medical Association.

Post Training Plans of Physicians Completing Graduate Medical Training in Michigan[6]

Fewer than half (40 percent) of the physicians who completed allopathic graduate medical training in Michigan in the 2003/04 academic year planned to enter practice after their training was completed (Table 7). Physicians completing training in hospital-based specialties were the most likely (51 percent) to have plans to enter practice after their training was completed. They were followed closely by physicians completing training in primary care specialties (46 percent). The physicians least likely to have plans to enter practice after training were those completing training in surgical specialties and subspecialties; just 23 percent of the physicians had plans to enter practice upon completion of their training. In terms of specific specialties, physicians in obstetrics and gynecology, emergency medicine, and allergy and immunology were the most likely to have plans to enter practice upon completion of their training.

Slightly more than one-quarter (26 percent) of the physicians who completed allopathic graduate medical training in the 2003/04 academic year planned to pursue additional training upon the completion of their training. Those completing surgical specialty and subspecialty training were the most likely to have such plans (close to 40 percent). The least likely were those physicians completing internal medicine subspecialty and pediatric subspecialty training, with 13 percent and 7 percent, respectively, having plans to pursue additional training upon the completion of their training. In terms of specific specialties, physicians completing training in neurology and diagnostic radiology were the most likely to have plans to seek additional training upon completion of their current training, with more than 70 percent of the physicians reporting to have such plans.

Academia was the last significant defined post-completion activity with 11 percent of the physicians completing training in Michigan in 2003/04 planning to enter academia upon completion of their current training. Those completing pediatric subspecialty and internal medicine subspecialty training were the most likely to have plans to enter academia after their training was completed. In terms of specific specialties, physicians completing training in thoracic surgery (40 percent), urology (40 percent), and neurological surgery (20 percent) were the most likely to have plans to enter academia upon completion of their training. The least likely to have plans to enter academia were those completing training in primary care specialties and hospital-based specialties. In terms of specific specialties, physicians completing training in diagnostic radiology, colon and rectal surgery, orthopedic surgery, allergy and immunology, dermatology, neurology, preventive medicine, and psychiatry did not have plans to enter academic medicine upon completion of their current training.

Very few physicians completing graduate medical training in Michigan in 2003/04 had plans involving military service (1 percent), being unemployed (1 percent), or leaving the country (less than 1 percent). It is, however, rather disconcerting that 12 percent of the physicians completing training in general pediatrics were reported to be unemployed.

[6] Data on post-training plans of physicians completing training in Michigan were obtained through their program directors to the American Medical Association.

Table 7 – Post Training Plans of Physicians Completing Allopathic Graduate Medical Training in Michigan, 2003/04, as Reported by Their Program Directors

	Additional Training	Enter Practice	Academia	Military	Leave Country	Unemployed	Other/ Unreported
Primary Care Specialties							
Family Medicine	6%	56%	4%	2%	1%	0%	30%
Internal Medicine	41%	32%	10%	0%	0%	2%	15%
Obstetrics and Gynecology	6%	83%	2%	0%	2%	4%	4%
Pediatrics	28%	46%	8%	0%	0%	12%	6%
Hospital-based Specialties							
Anesthesiology	26%	55%	13%	3%	0%	0%	3%
Emergency Medicine	6%	76%	12%	2%	0%	1%	3%
Pathology - Anatomic and Clinical	54%	0%	8%	0%	0%	0%	38%
Radiology - Diagnostic	73%	14%	0%	0%	0%	0%	14%
Surgical Specialties and Subspecialties							
General Surgery	55%	22%	10%	2%	2%	0%	10%
Colon and Rectal Surgery	33%	33%	0%	0%	0%	0%	33%
Neurological Surgery	40%	40%	20%	0%	0%	0%	0%
Ophthalmology	40%	55%	5%	0%	0%	0%	0%
Orthopedic Surgery	57%	0%	0%	0%	0%	0%	43%
Otolaryngology	9%	27%	9%	0%	0%	0%	55%
Plastic Surgery	17%	25%	17%	0%	0%	0%	42%
Thoracic Surgery	20%	40%	40%	0%	0%	0%	0%
Urology	20%	10%	40%	0%	0%	0%	30%
Surgical Subspecialties	0%	20%	33%	7%	7%	0%	33%
Internal Medicine Subspecialties	13%	37%	16%	1%	0%	0%	34%
Pediatric Subspecialties	7%	25%	39%	0%	0%	0%	29%
Combined Specialties	18%	42%	12%	0%	0%	0%	27%
Other Specialties and Subspecialties							
Allergy and Immunology	0%	67%	0%	0%	0%	0%	33%
Dermatology	17%	17%	0%	0%	0%	0%	67%
Neurology	77%	0%	0%	0%	0%	0%	23%
Physical Medicine and Rehabilitation	31%	50%	13%	0%	0%	6%	0%
Preventive Medicine	0%	100%	0%	0%	0%	0%	0%
Psychiatry	25%	33%	0%	0%	0%	0%	42%
Transitional Year	15%	34%	19%	0%	0%	0%	32%
All Others	0%	67%	0%	0%	0%	0%	33%
Total	**26%**	**40%**	**11%**	**1%**	**0%**	**1%**	**20%**

Source: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 2004/05. American Medical Association.

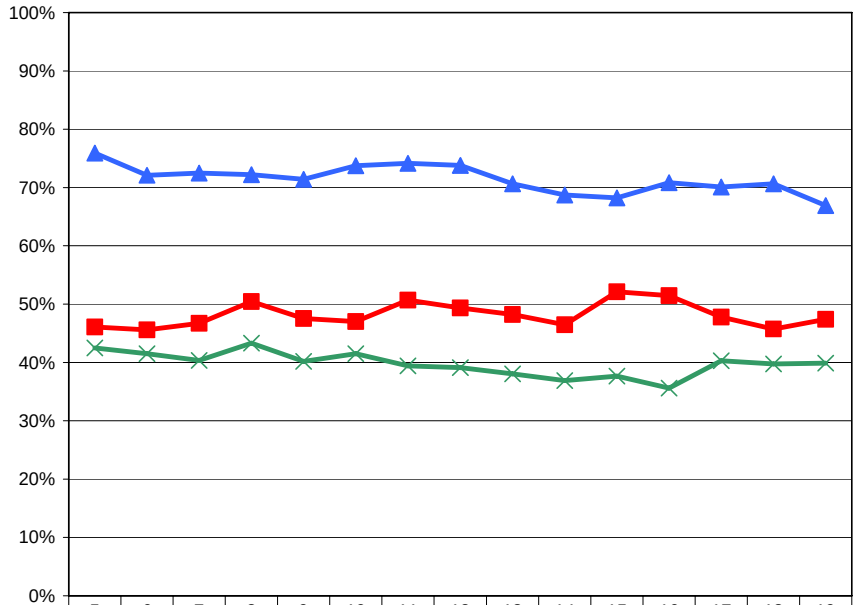
Table 8 – Location of New Practice of Physicians Completing Graduate Medical Education in Michigan who Plan to Enter Practice, 2003/04

	In-state	Out-of-state
Primary Care Specialties		
Family Medicine	67%	33%
Internal Medicine	61%	39%
Obstetrics and Gynecology	43%	57%
Pediatrics	33%	67%
Hospital-based Specialties		
Anesthesiology	53%	47%
Emergency Medicine	37%	63%
Pathology - Anatomic and Clinical	--	--
Radiology - Diagnostic	43%	57%
Surgical Specialties and Subspecialties		
General Surgery	29%	71%
Colon and Rectal Surgery	0%	100%
Neurological Surgery	0%	100%
Ophthalmology	57%	43%
Orthopedic Surgery	--	--
Otolaryngology	33%	67%
Plastic Surgery	0%	100%
Thoracic Surgery	0%	100%
Urology	0%	100%
Surgical Subspecialties	33%	67%
Internal Medicine Subspecialties	36%	64%
Pediatric Subspecialties	33%	67%
Combined Specialties	70%	30%
Other Specialties and Subspecialties		
Allergy and Immunology	75%	25%
Dermatology	50%	50%
Neurology	--	--
Physical Medicine and Rehabilitation	50%	50%
Preventive Medicine	100%	0%
Psychiatry	38%	63%
Transitional Year	43%	57%
All Others	75%	25%
Total	**47%**	**53%**

Sources: State-level Data for Accredited Graduate Medical Education Programs in the U.S., 2004/05. American Medical Association.

For the physicians who were reported to have plans to enter practice after they completed training, less than half (47 percent) had plans to remain in the state (Table 8). Only primary care physicians were more likely to have plans to practice in Michigan than leave. Specifically, physicians completing training in family medicine (67 percent) and general internal medicine (61 percent) were more likely to have plans to remain in the state to practice than to leave upon completing their training. In all but a few of the surgical specialties, all of the physicians completing training who had plans to go into practice had plans to leave the state. Also noteworthy, physicians completing training in obstetrics and gynecology (57 percent), pediatrics (67 percent), emergency medicine (63 percent), and general surgery (71 percent) who had plans to enter practice after their current training was complete had plans to leave the state.

Figure 7 – Percentage of Physicians who Ever Obtained Undergraduate and/or Graduate Medical Training in Michigan who were Practicing in Michigan in 2004 by Number of Years Post-Completion of Training.



	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Medical School in Michigan	46%	46%	47%	50%	48%	47%	51%	49%	48%	46%	52%	51%	48%	46%	47%
Most Recent Residency in Michigan	42%	42%	40%	43%	40%	42%	39%	39%	38%	37%	38%	36%	40%	40%	40%
Medical School and Most Recent Residency in Michigan	76%	72%	72%	72%	71%	74%	74%	74%	71%	69%	68%	71%	70%	71%	67%

Years Since Education/Training Completed in MI

Source: American Medical Association Physician Masterfile, December 2004.

Any particular year's rate of retention among trainees, though, was less important than the trend in the number of physicians trained in the state who ended up establishing their practice there. Figure 7 shows the long-term retention trends for physicians trained in Michigan to varying degrees. As is evident, physicians who completed undergraduate or graduate medical training in Michigan had about a 40 percent to 50 percent chance of practicing in Michigan in the 20 years after they completed their training. There was a slight downward trend as the years after training was completed increased, thus the chance that a physician trained in Michigan was practicing in state declined over time, unsurprisingly. However, the decline was very small, and not entirely

consistent. For physicians who completed both their undergraduate medical education and their most recent graduate medical training in Michigan, the likelihood of practicing in the state in 2004 was very high, exceeding 70 percent over time. As was the case with physicians who either graduated from a Michigan medical school or who had completed their graduate medical training in the state, there was a very slight decline in the likelihood of practicing in Michigan in 2004 as the years since graduation increased.

Chapter 6: Physician Supply and Demand Forecasting in the U.S.

Since the mid-1960s, the nation has struggled with a series of physician workforce issues: determining the appropriate number of physicians needed to adequately care for the population, the role of international medical school graduates, the mix of primary care and non-primary care physicians, lack of diversity in medicine, mal-distribution of existing physician resources, and, more recently, the evolving demographics of the profession.

Growth of the Physician Workforce in the U.S.: 1960 to the present

Between 1960 and 1980, the number of allopathic medical schools in the U.S. grew from 85 to 126, and the number of graduates more than doubled from 7,081 to 15,113 (AAMC 2001). Moreover, the nation's physician supply grew rapidly, increasing from 235,303 active allopathic physicians in 1965 to 316,491 in 1975 (AMA 1976). In 1976, in response to concerns about the rapidly growing supply of physicians, the Graduate Medical Education National Advisory Committee (GMENAC) was established to advise the nation on how many physicians were needed in the U.S., in total and by specialty (GMENAC 1981). In 1980, GMENAC concluded that the nation faced a potentially serious surplus and recommended the nation limit the number of medical school positions and severely restrict the number of international medical school graduates (IMGs) entering the U.S. (GMENAC 1981).

When GMENAC issued its report in 1980, there were 419,228 active physicians in the U.S. (Salsberg and Forte 2002). The surplus GMENAC envisioned was based on an estimate that the number of physicians would grow to 535,750 by 1990 and 642,950 by 2000 unless steps were taken to reduce the growth in physicians (GMENAC 1981).

Concerns about a potential surplus escalated with the publication of several papers in the early 1990s suggesting that the expansion of managed care and its emphasis on primary care would lead to an even greater surplus of physicians than predicted by GMENAC, especially medical and surgical specialists (Weiner, 1994, 1995; Gamliel, et al., 1995; Wennberg, 1993). In fact, Weiner estimated that under certain managed care expansion scenarios the nation required between 138 and 144 patient care physicians per 100,000 population, a level well below the 191 physicians per 100,000 population suggested by GMENAC (Salsberg and Forte, 2002). Since the nation already had 214 active physicians per 100,000 in 1990 and was experiencing a period of physician supply growth, the specter of a massive surplus of physicians by the turn of the century was raised. This concern was also echoed by the federal Council on Graduate Medical Education (COGME). In several reports between 1992 and 1998, the COGME reaffirmed its concern with a potential surplus of physicians (COGME 1992; 1994; 1995a; 1995b; 1996; 1998).

In 2000, there were approximately 779,723 active physicians in the U.S., or 276 physicians per 100,000 population. However, if the GMENAC methodology for calculating physician supply was used, including a downward adjustment for physicians in training, the supply of physicians in 2000 would have been 676,381, or 240 physicians per 100,000 population. Thus, as predicted by GMENAC, the physician supply in the U.S. grew very rapidly. Between 1980 and 2000, the physician supply in the U.S. increased by more than 320,000 physicians.

Physician Workforce Policy: 1986 to the present

Although the federal government does not control the education, training, and supply of physicians in the U.S., a series of publicly supported reports and studies along with the work of the federal Council on Graduate Medical Education (COGME) have provided important guidance to the medical education and training community. COGME was authorized by Congress in 1986 to act as the federal physician workforce planning group (Grumbach, 2002a).

A central charge of COGME was to make policy recommendations with respect to the adequacy of the supply and distribution of physicians in the U.S. including current and future shortages or excesses of physicians in the medical and surgical specialties and subspecialties. Since 1992, COGME held a set of physician workforce policy goals centered on its 110/50-50 recommendations, first articulated in its *Third Report*: *Improving Access to Health Care Through Physician Workforce Reform: Directions for the 21st Century* (1992).

The 110/50-50 recommendations called for reducing the number of physicians entering residency training from what was then 140 percent to 110 percent of the number of graduates from allopathic and osteopathic medical schools in the U.S. in 1993 and increasing the percentage of those graduates who complete training and enter practice as generalists from the level then at 30 percent to at least 50 percent. Several years later, COGME's *Eighth Report*: *Patient Care Physician Supply and Requirements: Testing COGME Recommendations* (1996) provided projections of physician supply and requirements that supported the sagacity of the recommendations laid out in the *Third Report*.

In assessing the progress made towards the COGME 110/50-50 goals, COGME's *Fourteenth Report*: *COGME Physician Workforce Policies: Recent Developments and Remaining Challenges in Meeting National Goals* (1999), found that as of the 1997-98 academic year, the nation's first year residents numbered approximately 129 percent of the number of graduates of allopathic and osteopathic medical schools in the U.S., and that it would be necessary to reduce the number of first year residents by about 3,400 to reach the 110 percent goal. Moreover, the *Fourteenth Report* found that while the number of generalists completing training each year had increased from earlier periods, the nation was still training too few generalists and too many specialists.

Moreover, several examinations of the balance of supply of and demand for physicians suggested that the nation may be facing a shortage rather than a surplus of physicians in the coming years (Cooper, 2002; Cooper et al., 2002; Cooper et al., 2003; Bland and Isaacs, 2002; Forte et al., 2000). The work of Cooper, especially, started with the premise of a physician marketplace where consumers purchase services from physicians – the important drivers in such a system are population growth and population wealth.

The arguments and justifications employed in the *Third Report*, however, were not based on market considerations. Instead, they were based on public health considerations including universal access to health care, cost efficiency, and the goals of cost-effective levels of physician supply and the appropriate mix of generalists to provide for the health needs of the U.S. The empirical evidence to support the recommended generalist/specialist mix (50-50) was drawn

from international comparisons and from staffing patterns of closed managed care health care systems. As was revealed in *Fourteen Report* and other work, the models that informed the 110/50-50 recommendations were based on a health care delivery systems which had never been implemented as pervasively as predicted (Grumbach, 2002a), had changed sufficiently to render the recommendations obsolete, or had problems of their own (i.e., international supply/need imbalances).

Ultimately, in 2002 the COGME commissioned a report to take another look at physician workforce projections. In January 2005, the COGME released the findings of its re-examination of the previous physician workforce projections in its *Sixteenth Report: Physician Workforce Policy Guidelines for the United States, 2000 – 2020.* The report detailed forecasts of national physician supply and demand that indicated a substantial shortage of physicians by 2020. The magnitude of the shortage was estimated at 85,000 to 96,000 physicians, or between 7.5 and 8.5 percent of the likely number of physicians required to provide services for the nation's population in 2020.

The *Sixteenth Report* joined a growing number of voices that had arrived at the same troubling conclusion. In the late 1990s, prominent physician workforce researchers began to question the notion of a national physician surplus widely held earlier in the decade. With aging general and physician populations, a stagnant medical education and training effort, more than 4,000 designated primary care Health Professional Shortage Areas, a decline in the growth of managed care, a willingness of payors to continue supporting rising rates of physician utilization, and reports from a dozen medical specialties of current or impending physician shortages, it no longer made sense to think in terms of physician surpluses. The COGME's report attempted to bring all of these observations together.

One of the failings of the *Sixteenth Report*, however, was its lack of attention to regional and specialty-specific variations embedded in its forecasts. Thus, one of the ramifications of the report was movement by concerned stakeholders in a number of states to determine how the projected national physician shortage would play out in their areas. Amid renewed discussion of the adequacy of the physician workforce nationally, several pioneering states took it upon themselves to conduct assessments of the adequacy of their supplies of physicians now and with an eye to the future. Arizona, California, Florida, Kentucky, Massachusetts, Michigan, Mississippi, New Mexico, North Carolina, Oregon, Texas, Wisconsin, and others have either finished an assessment or are in the midst of one. Arizona, Florida, and Texas deemed it necessary to expand medical school capacity in their states in order to assure an adequate supply of physicians in the future. Moreover, as was stated above, in the past several years, specialty-specific examinations in Cardiology, Endocrinology, Allergy and Immunology, Psychiatry, Neurosurgery, Pediatric Subspecialties, Dermatology, Medical Genetics, Radiology, Geriatric Medicine, and Critical Care also yielded findings of current or future shortages of physicians.

Approaches to Forecasting Physician Supply and Demand

The two basic approaches to examining physician workforce requirements, the first based on market demand, the other based on public health goals (need), have been long recognized by health workforce researchers. The demand approaches examine economic indicators such as the functional relationships between the volume of medical services populations desire to consume at given levels of cost, financial resources, population size, individual desires and preferences as reflected in the psychological wants of populations, and the quality of the job market for physicians in specific specialties in specific geographical areas. The need approaches attempt to incorporate concerns around public health and normative public policy that promotes the health of the nation in a financially responsible manner.

Not surprisingly, as the assumptions underlying the two basic approaches are different, many times the conclusions and policy recommendations drawn from analyses based on these approaches differ. Proponents of both approaches have argued that employing only one of these approaches may be a necessary but insufficient basis for developing physician workforce policy. Using a market-based approach alone can produce recommendations which mirror the current health care delivery system, with all of its advantages and disadvantages, while considering a need-based approach alone can produce unreachable policy goals and untenable policy recommendations due to disagreement with society's desires and preferences.

Factors Affecting Physicians Supply and Demand

Supply
In order to accurately forecast the supply of physicians in a geographic location, it is helpful to take into consideration the following:

1) The overall number of new entrants into the physician workforce and the source of the new entrants;

2) The gender distribution of the current physician supply and of new entrants and its effect on the relative number of hours spent in professional activities (to accurately calculate full-time equivalents or FTEs);

3) The age distribution of the current physician supply;

4) Retirement, death, and other separation rates of the current physician supply;

5) The specialty distribution of the current physician supply and the specialty choices of new entrants;

6) The rates of different types of professional activities (patient care, teaching, research, etc.) of the current physician supply; and

7) Physician migration patterns (both into and out of a particular area).

In addition, over the last two decades, the physician workforce experienced a number of key transformations. To the extent that data are available, these transformations should be taken into consideration when forecasting the future supply of physicians:

Demographic Evolution and Physician Work Effort

Women in Medicine

Women have made great strides in medicine over the past 20 years, nearly tripling their representation in the profession. Currently making up more than 28 percent of the physician workforce (Smart, 2006), women will continue to become a larger part of the workforce; women comprise nearly 50 percent of the students enrolled in U.S. medical schools (Journal of the American Medical Association, 2005).

A number of studies have documented that women work fewer hours over the course of their professional work life than men (Kletke, Marder and Silberger, 1990; Bobula, 1980; Martin et al., 1988; Cooper, 1994; AMWAC/AHIW, 1996, 1998; Sullivan and Buske, 1998; Forte and Salsberg, 1999). This phenomenon may reflect time taken for child-rearing, providing care for elderly parents or other relatives, and other family concerns. Recent research has, however, suggested that women are not the only physicians working less. Instead, some (Bland and Isaacs, 2002; Gelfand et al., 2002; Dorsey et al., 2003) claim this phenomenon of women working fewer hours is part of a larger generational phenomenon, perhaps not limited to medicine (Bond et al., 1998; Lang, 2000; Gutner, 2002). Interestingly, there are also some indications that older physicians are reducing the hours they work (Cooper, 2002).

Aging of the Physician Workforce

Like the general U.S. population, physicians, as a group, are growing older. In fact, between 1982 and 2004 the proportion of active physicians ages 65 and older increased from 8 percent to 11 percent. In 2004, there were more than 84,000 active physicians who were 65 years of age or older, another 142,000 between ages 55 and 64 who will reach age 65 by 2014, and another 215,000 between ages 45 and 54 who will reach age 65 by 2024 (AMA, 1984; AMA, 2006).

Separation from the Physician Workforce

In some ways separation from the physician workforce is related to age. As a physician ages, he/she is more likely to leave practice for one reason or another, be it retirement, death, or other reasons. With the aging of the physician population, a larger and larger proportion of the physician workforce will be reaching the traditional age of retirement in the near future.

There is no way to know with certainty the actual retirement patterns of physicians in future years. If the baby boom generation of physicians retires earlier than past generations, this would significantly reduce the supply of physicians in the next decade. On the other hand, if physicians are working fewer hours per week due to changing lifestyle choices, they may stay in practice for a longer period of time, not having as much chance to “burn-out” or become dissatisfied for

some other reason. This phenomenon might lead to an increase in the supply of physicians in the future.

Productivity Changes due to Technology Developments

Another important factor than can influence the available supply of physicians is their productivity. Productivity, in this instance, is defined as output per unit of time spent in practice. Currently, there are, and certainly in the future, there will be more, changes occurring in medical practice that allow physicians to practice more efficiently. New medical technologies, particularly in the area of information systems, could lead to an increase in physician productivity; for example, the electronic medical record could allow physicians to quickly, easily, and accurately access and assess all the necessary information on a patient's history instead of having to order the file be sent to him/her, then shuffling through the pages in the file. Estimates of the potential productivity gains through the use of new technologies or implementation of already existing technologies are widely variable (Blumenthal, 2002; Masys, 2002; Goldsmith et al., 2003). A recent study suggests a potential gain of up to 20 percent through the use of technology (Corrigan, 2003).

Resident and Fellow Work Hour Restrictions

The recent implementation of regulations limiting resident and fellow work hours to 80 or fewer should be taken into account when estimating the future physician supply. While the general impact of these regulations is clear – the total supply of physicians (FTEs) will decrease -- it is unclear what the magnitude of the effect will be. It is unclear how much of the reduction in hours worked per week will come from patient care compared to educational activities. It is also possible that reduced work hours during training and increased flexibility in scheduling will contribute to changes in new physicians' practice patterns after training such as increased job sharing and reduced patient care hours, potentially amplifying the different practice patterns already observed among the newest generation of physicians.

Specialty Distribution and Choices

The issue of specialty distribution and choice has less to do with the overall supply of physicians than with the types of services provided by physicians. The specific specialty a physician practices has implications for the types of services provided. There have been a number of attempts at understanding the reasons behind physicians' specialty choices (Hay, 1991; Hurley, 1991; Nicholson, 2002; Puccio et al., 2002; Newton and Grayson, 2003; Dorsey et al., 2003). The factors most often cited to explain variation in specialty choice include expected income, intellectual content of the specialty, research opportunities in the specialty, prestige of the specialty, gender and race/ethnicity of the physician, family considerations, and so forth.

Changing Physician Professional Activities

Being a physician involves a variety of activities, including patient care, medical teaching, medical research, and other professional activities. Physicians, however, are not limited to those types of activities. The rate at which the supply of physicians participates in activities within

their field of expertise (i.e., medicine) and activities outside the realm of medicine directly affects the number of available physicians. If activities outside of the scope of what are currently considered the professional activities of a physician (e.g., physicians working as financial analysts, insurance consultants, pharmaceutical consultants) become more attractive to physicians, the supply of physicians will decrease.

Moreover, changes in the distribution of activities in which a physician participates could also have effects on the supply of physicians. For example, the average physician typically spends the most amount of his/her time in patient care. If more physicians devoted more time to research, the supply of physicians providing patient care services would decrease.

Demand

In order to accurately forecast the demand for physicians in a geographic location, it is helpful to take into consideration the following:

1) Physician utilization rates by age, gender, and race/ethnicity;

2) Physician utilization rates by practice setting and insurance status; and

3) Current and future population counts by age, gender, race/ethnicity, practice setting, and insurance status.

In addition, forecasts of the future demand for physicians should seek to account for the following key factors:

Population Wealth

Based on a perspective currently championed by Cooper et al. (2002; 2003) (past proponents include Schwartz and colleagues in the late 1980s and early 1990s [1989; 1990] and Roehrig and Eisenstein [1999]), the trend in population wealth should be considered in demand forecasts. This perspective suggests that there are four major factors driving demand for physician services: economic expansion, population growth, work effort of physicians, and services provided by other practitioners (i.e., non-physician clinicians). Cooper et al. suggested the most important of the four factors affecting physician demand is economic expansion. They found a consistent correlation between the supply of physicians and economic growth. However, Cooper and colleagues suggested that the relationship is complex. Economic growth induced growth in demand for health services, causing a rise in health care spending. This growth in health care spending, in turn, led to a growth in the health care workforce, of which physicians are an important part.

This perspective is certainly not without opponents (e.g., Grumbach, 2002b; Barer, 2002; Weiner, 2002). It is easy to believe that in an environment of increasing health care costs and declining budgets, resistance to this sort of perspective is assured. However, only one peer-reviewed research article has presented data that challenge Cooper and colleagues' findings (Anderson et al., 2003).

Utilization Rate Changes

By definition, the most important drivers of demand for physicians are utilization rates. Thus, it is important to understand how those rates might be changing over time. With respect to age, independent investigation shows that utilization rates are changing. Most observers are familiar with findings that indicate that as the population grows older, overall utilization increases because utilization rates increase with age. The number of people older than age 65 is increasing and will increase significantly in the coming years. Clearly, the aging of the population will lead to an increase in demand for physician services. However, if one examines utilization rates over time, especially physician office visits, it becomes evident that use rates by age group are changing.

Analysis of the National Ambulatory Medical Care Survey (NAMCS) data from 1980, 1990, and 2000 on visits to physician offices by age group indicated that the number of physician visits per capita for age groups over age 45 has been increasing over the past couple of decades. There is reason to believe that this trend will continue over the next decade and may even accelerate as the baby boom generation ages. The baby boom generation has grown up with high expectations for health care and experienced higher utilization rates than those of previous generations. In addition, as baby boomers age, many, although certainly not all, will have disposable income that they may choose to spend on health care (Knickman et al., 2003).

Between 1980 and 2000 crude per capita visits to physician offices increased from 2.4 to 2.9. This increase was not evenly distributed across age groups, however. The largest gain was experienced among persons 75 to 84 years of age, increasing from 3.5 visits to 6.3 visits annually. All of the other groups older than age 45 experienced gains as well, except the 85 years of age and older group. It turns out, however, that even though there was a global increase in utilization, for persons in the 15 to 24 year old and the 25 to 34 year old age groups utilization rates declined between 1980 and 2000. Further, the more recent changes in utilization (i.e., 1990 compared to 2000) demonstrated a uniform set of increases and declines, with all groups younger than age 45 experiencing declines in annual per capita visits to physician offices and those ages 45 and older experiencing increases in annual per capita physician office visit rates.

Elimination of Unnecessary Services

One of the problems associated with using actual utilization rates observed in the population under study is that while they are accurate, they too closely resemble reality, including not only the beneficial qualities of the current health care delivery system, but also its faults. In particular, the unnecessary services common in the current health care delivery system are reflected in those utilization rates.

There are a number of reasons to believe some current use is unnecessary or only marginally beneficial. Possible causes include poor physician performance due to an oversupply of physicians in a geographical area, the complexities of current treatment modalities and the inability of individual physicians to sort through them competently enough to make an appropriate decision about which test(s)/treatment(s) is(are) appropriate, advertisements targeted

toward the public that induce patients to request services from their physicians, the financial pressure on facilities, the outright greed of a very small minority in the medical profession, the ongoing medical liability crisis and the resultant practice of "defensive medicine," a financing/reimbursement system that gives incentives to provide services without regard to outcomes. Regardless of the causes of the unnecessary provision, there exists a long-standing, compelling argument that a substantial portion of the services provided by physicians and other practitioners in the health care delivery system are simply unnecessary or of marginal benefit. Further, it is argued that it is these unnecessary services that are driving up health care costs and spending in the aggregate. And thus, proponents of this perspective argue that the elimination of these unnecessary and marginal services provides two essential goods: efficiency and cost savings (Fisher et al., 2003a).

The work of Wennberg and colleagues showing the diminishing rates of benefit to the community of additional physicians can certainly be thought of as supporting this perspective. Recently, the work of Fisher et al. (2003a; 2003b) showing the lack of a relationship (and sometimes a negative relationship) between the provision of services, level of spending on services, health care outcomes, and patient satisfaction provides additional support for the perspective. Recent work by Goodman et al. (2006) also provides evidence of the lack of relationship between quantity of end-of-life services and quality of care provided to Medicare beneficiaries.

Approaching the issue from a slightly different perspective, Weiner (1994; 1995; 2004) and others (Hart et al., 1997; Goodman et al., 1997) have attempted to estimate demand for physician services in a way that bypasses these unnecessary services by examining closed, organized systems of health care delivery that employ more or less rigorous utilization review. In the early and mid 1990s, these examinations revolved around staff-model HMOs. This work has most recently evolved to examine large prepaid group practices having contracts with managed care plans (Weiner, 2004). The earlier work found that staff-model HMOs were able to provide equivalent quality of care with drastically smaller physician staffing levels. Those who looked more closely at these organizations found that patients were actually using quite a bit of out-of-network services and challenged this early work (Hart et al., 1997). This work continues, however; and the most recent updates show that while in the past these delivery systems may have required lower staffing levels, over time they expanded – although not quite to the levels observed outside of these delivery systems (Weiner, 2004).

The most recent research in this area (Fisher et al., 2003b; Weiner, 2004), suggests that between 20 percent and 35 percent of the services currently provided are unnecessary or would not occur under a more rigorous system of utilization review.

Chapter 7: Michigan Physician Supply Forecasting

State Level Physician Supply Forecasts

Forecasts of the supply of physicians in Michigan were based upon the methodology employed in the Physician Supply Model (PSM) developed and maintained by the Bureau of Health Professions, in the Health Resources and Services Administration of the Department of Health and Human Services and used to generate national forecasts for the COGME report referenced above. The PSM forecasts the future supply of physicians according to the following steps:

- Current counts of active physicians (allopathic and osteopathic) are tabulated by age, sex, year of graduation, and specialty
- Numbers of newly trained physicians expected to enter graduate medical education (GME) each year (new entrants) are estimated by age and sex
- Forecast counts of active physicians are generated by reducing current counts by the estimated numbers of deaths and retirements and then adding in new entrants
- Forecast counts are converted to full-time equivalents (FTEs) using information on hours worked by age, sex, and specialty.

In order to apply this national methodology to the state of Michigan, it was necessary to adjust the model results to account for interstate migration of active physicians.

The methodology described above was implemented for Michigan as follows:

- Counts of active physicians by age, sex, and specialty were tabulated from the year-end 2004 AMA Physician Masterfile
- Numbers of new GME entrants were estimated from historical data on first-year-GME physicians in Michigan culled from the AMA's Graduate Medical Education Database archive
- Specialty distributions were estimated for newly entering cohorts based upon historical trends in specialties of recent Michigan physician cohorts
- PSM parameters were used to forecast deaths and retirements and to convert counts into FTEs
- The net migration adjustment was estimated based upon a study of historical trends in net migration.

State Level Supply Scenario 1: Baseline Forecast. Baseline forecasts were generated through 2020 and rescaled slightly to match the 2005 benchmark.[7] In this scenario, it was assumed that all of the parameters and inputs of the supply model would remain constant over the forecast period. The baseline forecast did incorporate reductions in work hours due to the demographic changes occurring in the physician workforce over time, e.g., increasing percentage of female physicians and older physicians.

[7] The 2005 benchmark was based upon the Michigan State Medical Society-sponsored report (Rosen 2005) completed in the summer of 2005. The benchmark was chosen as a way of bringing the two projects more closely in line in terms of starting points. The actual rescaling amounted to a 1 percent increase.

In addition to this baseline forecast of state-level physicians by specialty, a number of scenarios generated with alternative assumptions. Each is discussed below.

State Level Supply Scenario 2: Reduced Work Hours Forecast. The purpose of this scenario was to examine the effect of an additional decline in work hours that affects all physicians. Under this scenario, work hours of all physicians were forecast to decline steadily between 2010 and 2020 with a final overall decline of 5 percent. This scenario was implemented by reducing the number of FTEs evenly between 2010 and 2020 such that the 2020 figure was five percent below the baseline.

State Level Supply Scenario 3: Increased Productivity Forecast. The baseline forecast assumed no change in physician productivity. In this scenario, physician productivity was projected to increase by ten percent between 2010 and 2020 – roughly one percent per year. This could occur for a number of reasons including increased automation of physician practices and greater use of non-physician staff. For modeling purposes, increases in productivity are the equivalent of increasing the supply of services that can be delivered by a given number of physician hours. The effect was equivalent to increasing the number of hours physicians work by ten percent. Therefore, this scenario was implemented by increasing the number of FTEs evenly between 2010 and 2020 such that the 2020 figure was ten percent above the baseline.

State Level Supply Scenario 4: Reduced Work Hours and Increased Productivity Forecast. This scenario brought together Supply Scenarios 2 and 3 by combining a five percent reduction in work hours with a ten percent increase in productivity. The net effect of the combination was a five percent increase in productivity and was implemented as such.

Regional Physician Supply Forecasts
Regional forecasts of physician supply were developed under two scenarios:

- *Non-responsive Supply Forecast.* The proportion of statewide physicians allocated to each region remains constant.
- *Responsive Supply Forecast.* The proportion of statewide physicians allocated to each region changes over time to reflect changes in the regional share of physician demand.

In effect, the first regional scenario assumed no locational adjustment in response to changes in demand, while the second assumed complete adjustment, that is, physicians distribute themselves in exact accordance with regional changes in demand. While it is acknowledged that actual physician location decisions are likely to fall somewhere between these two scenarios, it is likely that they would more closely resemble the latter than the former.

Michigan Physician Supply, 2005 – 2020

State Level Supply Scenario 1: Baseline
The supply model forecast a 10 percent increase in the supply of physicians between 2005 and 2020, with the number of active physicians predicted to increase from 30,366 in 2005 to 33,462 in 2020. Adjusting for the projected population growth in the state (5 percent), the physician to

population ratio was predicted to grow from 297 physicians per 100,000 population to 313 physicians per 100,000 population.

Figure 13 – Michigan Physician Supply Forecast, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,756	10,428,683	305
2015	32,814	10,599,122	310
2020	33,462	10,695,993	313
Percent Change 2005-2020	10%	5%	5%

Primary care physicians were forecast to grow by 10 percent between 2005 and 2020, with the number of active physicians predicted to increase from 11,744 in 2005 to 12,889 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow from 115 physicians per 100,000 population to 121 physicians per 100,000 population.

Non-primary care physicians were also forecast to grow by 10 percent between 2005 and 2020, with the number of active physicians predicted to increase from 18,622 in 2005 to 20,574 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 192 physicians per 100,000 population.

Figure 14 – Michigan Primary Care and Non-Primary Care Physician Supply Forecast, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	12,691	10,599,122	120
2020	12,889	10,695,993	121
Percent Change 2005-2020	10%	5%	5%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,449	10,428,683	186
2015	20,124	10,599,122	190
2020	20,574	10,695,993	192
Percent Change 2005-2020	10%	5%	5%

Specialty-Specific Supply Forecasts

The supply model output forecasts for 18 specialties and specialty groups through 2020 in Michigan. In most cases, the supply of physicians was forecast to grow between 2005 and 2020. With the exception of Cardiologists, Pathologists, and Ophthalmologists, all specialties were forecast to grow. The forecast supply growth showed much variation with General/Family Physicians, General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, General Surgeons, Otolaryngologists, Orthopedic Surgeons, Urologists, and other Surgical Subspecialists growing at rates lower than the overall physician supply; and General Internists, other Internal Medicine Subspecialists, Anesthesiologists, and Emergency Medicine physicians growing at rates higher than the overall physician supply. Many specialties were forecast to grow more slowly than the general population of Michigan, including General Pediatricians, Psychiatrists, General

Surgeons, Ophthalmologists, Otolaryngologists, Orthopedic Surgeons, and other Surgical Subspecialists.

Primary Care Specialties

General/Family Medicine

General/Family Physicians were forecast to grow by 7 percent between 2005 and 2020, slightly below the overall predicted rate of growth among primary care physicians, with the number of active General/Family Physicians predicted to increase from 5,080 in 2005 to 5,420 in 2020. Adjusting for the projected population growth in the state, the General/Family Physician to population ratio was predicted to grow from 49.8 physicians per 100,000 population to 50.7 physicians per 100,000 population.

General Internal Medicine

General Internists were forecast to grow by 17 percent between 2005 and 2020, well above the overall predicted rate of growth among primary care physicians, with the number of active General Internists predicted to increase from 4,742 in 2005 to 5,525 in 2020. Adjusting for the projected population growth in the state, the General Internist to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 51.7 physicians per 100,000 population.

General Pediatrics

General Pediatricians were forecast to grow by just 1 percent between 2005 and 2020, well below the overall predicted rate of growth among primary care physicians, with the number of active General Pediatricians predicted to increase from 1,922 in 2005 to 1,944 in 2020. Adjusting for the projected population growth in the state, the General Pediatrician to population ratio was predicted to decline from 18.8 physicians per 100,000 population to 18.2 physicians per 100,000 population.

Figure 15 – Michigan Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	12,691	10,599,122	120
2020	12,889	10,695,993	121
Percent Change 2005-2020	10%	5%	5%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,222	10,428,683	50.1
2015	5,350	10,599,122	50.5
2020	5,420	10,695,993	50.7
Percent Change 2005-2020	7%	5%	2%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,127	10,428,683	49.2
2015	5,375	10,599,122	50.7
2020	5,525	10,695,993	51.7
Percent Change 2005-2020	17%	5%	11%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,958	10,428,683	18.8
2015	1,966	10,599,122	18.5
2020	1,944	10,695,993	18.2
Percent Change 2005-2020	1%	5%	-3%

Non-Primary Care Specialties

Cardiovascular Disease

Cardiologists were forecast to contract by 6 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Cardiologists predicted to decrease from 736 in 2005 to 693 in 2020. Adjusting for the projected population growth in the state, the Cardiologist to population ratio was predicted to decline from 7.2 physicians per 100,000 population to 6.5 physicians per 100,000 population.

Other Internal Medicine Subspecialties

Other Internal Medicine Subspecialists were forecast to grow by 20 percent between 2005 and 2020, well above the overall predicted rate of growth among non-primary care physicians, with the number of active physicians predicted to increase from 2,970 in 2005 to 3,549 in 2020. Adjusting for the projected population growth in the state, the other Internal Medicine Subspecialist to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 33.2 physicians per 100,000 population.

Obstetrics and Gynecology

Obstetrician/Gynecologists were forecast to grow by 9 percent between 2005 and 2020, slightly below the overall predicted rate of growth among non-primary care physicians, with the number of active Obstetrician/Gynecologists predicted to increase from 1,712 in 2005 to 1,860 in 2020. Adjusting for the projected population growth in the state, the Obstetrician/Gynecologist to population ratio was predicted to increase from 16.8 physicians per 100,000 population to 17.4 physicians per 100,000 population.

Pathology

Pathologists were forecast to contract by 6 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Pathologists predicted to decrease from 717 in 2005 to 676 in 2020. Adjusting for the projected population growth in the state, the Pathologist to population ratio was predicted to decrease from 7.0 physicians per 100,000 population to 6.3 physicians per 100,000 population.

Figure 16 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	735	10,428,683	7.0
2015	722	10,599,122	6.8
2020	693	10,695,993	6.5
Percent Change 2005-2020	-6%	5%	-10%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,190	10,428,683	30.6
2015	3,402	10,599,122	32.1
2020	3,549	10,695,993	33.2
Percent Change 2005-2020	20%	5%	14%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,790	10,428,683	17.2
2015	1,840	10,599,122	17.4
2020	1,860	10,695,993	17.4
Percent Change 2005-2020	9%	5%	4%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	702	10,428,683	6.7
2015	688	10,599,122	6.5
2020	676	10,695,993	6.3
Percent Change 2005-2020	-6%	5%	-10%

Psychiatry

Psychiatrists were forecast to grow by less than 1 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Psychiatrists predicted to barely increase from 1,357 in 2005 to 1,362 in 2020. Adjusting for the projected population growth in the state, the Psychiatrist to population ratio was predicted to decrease from 13.3 physicians per 100,000 population to 12.7 physicians per 100,000 population.

Anesthesiology

Anesthesiologists were forecast to grow by 17 percent between 2005 and 2020, well above the overall predicted growth among non-primary care physicians, with the number of active Anesthesiologists predicted to increase from 1,292 in 2005 to 1,506 in 2020. Adjusting for the projected population growth in the state, the Anesthesiologist to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 14.1 physicians per 100,000 population.

Radiology

Radiologists were forecast to grow by 10 percent between 2005 and 2020, about the same as the overall predicted growth among non-primary care physicians, with the number of active Radiologists predicted to increase from 1,375 in 2005 to 1,511 in 2020. Adjusting for the projected population growth in the state, the Radiologist to population ratio was predicted to increase from 13.5 physicians per 100,000 population to 14.1 physicians per 100,000 population.

Emergency Medicine

Emergency Medicine physicians were forecast to grow by 31 percent between 2005 and 2020, far above the overall predicted growth among non-primary care physicians, with the number of active Emergency Medicine physicians predicted to increase from 1,655 in 2005 to 2,175 in 2020. Adjusting for the projected population growth in the state, the Emergency Medicine

physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 20.3 physicians per 100,000 population.

Figure 17 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,352	10,428,683	13.0
2015	1,363	10,599,122	12.9
2020	1,362	10,695,993	12.7
Percent Change 2005-2020	0%	5%	-4%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,376	10,428,683	13.2
2015	1,448	10,599,122	13.7
2020	1,506	10,695,993	14.1
Percent Change 2005-2020	17%	5%	11%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,440	10,428,683	13.8
2015	1,478	10,599,122	13.9
2020	1,511	10,695,993	14.1
Percent Change 2005-2020	10%	5%	5%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,841	10,428,683	17.7
2015	2,020	10,599,122	19.1
2020	2,175	10,695,993	20.3
Percent Change 2005-2020	31%	5%	25%

General Surgery

General Surgeons were forecast to grow by 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active General Surgeons predicted to only increase from 1,648 in 2005 to 1,695 in 2020. Adjusting for the projected population growth in the state, the General Surgeons to population ratio was predicted to decrease from 16.1 physicians per 100,000 population to 15.8 physicians per 100,000 population.

Ophthalmology

Ophthalmologists were forecast to contract by 1 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Ophthalmologists predicted to decrease from 668 in 2005 to 663 in 2020. Adjusting for the projected population growth in the state, the Ophthalmologist to population ratio was predicted to decrease from 6.5 physicians per 100,000 population to 6.2 physicians per 100,000 population.

Otolaryngology

Otolaryngologists were forecast to grow by only 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Otolaryngologists predicted to increase from 317 in 2005 to 328 in 2020. Adjusting for the projected population growth in the state, the Otolaryngologist to population ratio was predicted to remain about the same at 3.1 physicians per 100,000 population throughout the forecast period.

Orthopedic Surgery

Orthopedic Surgeons were forecast to grow by 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Orthopedic Surgeons predicted to increase from 844 in 2005 to 872 in 2020. Adjusting for the projected population growth in the state, the Orthopedic Surgeon to population ratio was predicted to decrease very slightly from 8.3 physicians per 100,000 population to 8.2 physicians per 100,000 population.

Figure 18 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,681	10,428,683	16.1
2015	1,686	10,599,122	15.9
2020	1,695	10,695,993	15.8
Percent Change 2005-2020	3%	5%	-2%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	671	10,428,683	6.4
2015	662	10,599,122	6.3
2020	663	10,695,993	6.2
Percent Change 2005-2020	-1%	5%	-5%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	320	10,428,683	3.1
2015	325	10,599,122	3.1
2020	328	10,695,993	3.1
Percent Change 2005-2020	3%	5%	-1%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	857	10,428,683	8.2
2015	866	10,599,122	8.2
2020	872	10,695,993	8.2
Percent Change 2005-2020	3%	5%	-1%

Urology

Urologists were forecast to grow by 5 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Urologists predicted to increase from 375 in 2005 to 393 in 2020. Adjusting for the projected population growth in the state, the Urologist to population ratio was predicted to remain about the same at 3.7 physicians per 100,000 population throughout the forecast period.

Other Surgery Subspecialties

Other Surgical Subspecialists were forecast to grow by 3 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active physicians predicted to increase from 568 in 2005 to 586 in 2020. Adjusting for the projected population growth in the state, the other Surgical Subspecialist to population ratio was predicted to decrease very slightly from 5.6 physicians per 100,000 population to 5.5 physicians per 100,000 population.

Figure 19 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	388	10,428,683	3.7
2015	394	10,599,122	3.7
2020	393	10,695,993	3.7
Percent Change 2005-2020	5%	5%	0%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	581	10,428,683	5.6
2015	585	10,599,122	5.5
2020	586	10,695,993	5.5
Percent Change 2005-2020	3%	5%	-2%

State Level Supply Scenario 2: 5 percent Reduction in Physician Effort

In this scenario, the supply model forecast a 5 percent increase in the supply of physicians between 2005 and 2020, with the number of active physicians predicted to increase from 30,366 in 2005 to 31,789 in 2020. Adjusting for the projected population growth in the state (5 percent), the physician to population ratio was predicted to essentially be at the same level in 2020 (297 physicians per 100,000 population) as it was in 2005.

Figure 20 – Michigan Physician Supply Forecast, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,756	10,428,683	305
2015	31,994	10,599,122	302
2020	31,789	10,695,993	297
Percent Change 2005-2020	5%	5%	0%

Primary care physicians were forecast to grow by 4 percent between 2005 and 2020, with the number of active physicians predicted to increase from 11,744 in 2005 to 12,224 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to decline slightly from 115 physicians per 100,000 population to 114 physicians per 100,000 population.

Non-primary care physicians were also forecast to grow by 5 percent between 2005 and 2020, with the number of active physicians predicted to increase from 18,622 in 2005 to 19,545 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow very slightly from 182 physicians per 100,000 population to 183 physicians per 100,000 population.

Figure 21 – Michigan Primary Care and Non-Primary Care Physician Supply Forecast, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	12,374	10,599,122	117
2020	12,244	10,695,993	114
Percent Change 2005-2020	4%	5%	-1%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,449	10,428,683	186
2015	19,621	10,599,122	185
2020	19,545	10,695,993	183
Percent Change 2005-2020	5%	5%	0%

Specialty-Specific Supply Forecasts

In some cases, the supply of physicians was forecast to grow between 2005 and 2020 under this scenario. However, more specialties, including General Pediatrics, Cardiology, Pathology, Psychiatry, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, and other Surgical Subspecialists were forecast to contract in this scenario compared to the baseline. The forecast supply decline showed much variation with Cardiologists, Pathologists, and Ophthalmologists contracting at rates higher than 5 percent; and General Pediatricians, General Surgeons, Otolaryngologists, Orthopedic Surgeons, and other Surgical Subspecialists declining at rates lower than 5 percent. Growth in several specialties was forecast: General/Family Medicine (1 percent), General Internal Medicine (11 percent), Internal Medicine Subspecialists (other than Cardiology) (14 percent),Obstetrics and Gynecology (3 percent), Anesthesiology (11 percent), Radiology (4 percent), and Emergency Medicine (25 percent).

Primary Care Specialties

General/Family Medicine

General/Family Physicians were forecast to grow by 1 percent between 2005 and 2020, slightly below the overall predicted rate of growth among primary care physicians, with the number of active General/Family Physicians predicted to increase from 5,080 in 2005 to 5,149 in 2020. Adjusting for the projected population growth in the state, the General/Family Physician to population ratio was predicted to decline from 49.8 physicians per 100,000 population to 48.1 physicians per 100,000 population.

General Internal Medicine

General Internists were forecast to grow by 11 percent between 2005 and 2020, well above the overall predicted rate of growth among primary care physicians, with the number of active General Internists predicted to increase from 4,742 in 2005 to 5,249 in 2020. Adjusting for the projected population growth in the state, the General Internist to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 49.1 physicians per 100,000 population.

General Pediatrics

General Pediatricians were forecast to decline by 4 percent between 2005 and 2020, unlike the overall predicted rate of growth among primary care physicians, with the number of active General Pediatricians predicted to decrease from 1,922 in 2005 to 1,846 in 2020. Adjusting for the projected population growth in the state, the General Pediatrician to population ratio was predicted to decline from 18.8 physicians per 100,000 population to 17.3 physicians per 100,000 population.

Figure 22 – Michigan Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	12,374	10,599,122	117
2020	12,244	10,695,993	114
Percent Change 2005-2020	4%	5%	-1%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,222	10,428,683	50.1
2015	5,216	10,599,122	49.2
2020	5,149	10,695,993	48.1
Percent Change 2005-2020	1%	5%	-3%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,127	10,428,683	49.2
2015	5,240	10,599,122	49.4
2020	5,249	10,695,993	49.1
Percent Change 2005-2020	11%	5%	6%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,958	10,428,683	18.8
2015	1,917	10,599,122	18.1
2020	1,846	10,695,993	17.3
Percent Change 2005-2020	-4%	5%	-8%

Non-Primary Care Specialties

Cardiovascular Disease

Cardiologists were forecast to contract by 10 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Cardiologists predicted to decrease from 736 in 2005 to 659 in 2020. Adjusting for the projected population growth in the state, the Cardiologist to population ratio was predicted to decline from 7.2 physicians per 100,000 population to 6.2 physicians per 100,000 population.

Other Internal Medicine Subspecialties

Other Internal Medicine Subspecialists were forecast to grow by 14 percent between 2005 and 2020, well above the overall predicted rate of growth among non-primary care physicians, with the number of active physicians predicted to increase from 2,970 in 2005 to 3,372 in 2020. Adjusting for the projected population growth in the state, the other Internal Medicine Subspecialist to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 31.5 physicians per 100,000 population.

Obstetrics and Gynecology

Obstetrician/Gynecologists were forecast to grow by 3 percent between 2005 and 2020, slightly below the overall predicted rate of growth among non-primary care physicians, with the number of active Obstetrician/Gynecologists predicted to increase from 1,712 in 2005 to 1,767 in 2020. Adjusting for the projected population growth in the state, the Obstetrician/Gynecologist to population ratio was predicted to decrease slightly from 16.8 physicians per 100,000 population to 16.5 physicians per 100,000 population.

Pathology

Pathologists were forecast to contract by 11 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Pathologists

predicted to decrease from 717 in 2005 to 642 in 2020. Adjusting for the projected population growth in the state, the Pathologist to population ratio was predicted to decrease from 7.0 physicians per 100,000 population to 6.0 physicians per 100,000 population.

Figure 23 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	735	10,428,683	7.0
2015	704	10,599,122	6.6
2020	659	10,695,993	6.2
Percent Change 2005-2020	-10%	5%	-15%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,190	10,428,683	30.6
2015	3,317	10,599,122	31.3
2020	3,372	10,695,993	31.5
Percent Change 2005-2020	14%	5%	8%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,790	10,428,683	17.2
2015	1,794	10,599,122	16.9
2020	1,767	10,695,993	16.5
Percent Change 2005-2020	3%	5%	-2%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	702	10,428,683	6.7
2015	671	10,599,122	6.3
2020	642	10,695,993	6.0
Percent Change 2005-2020	-11%	5%	-15%

Psychiatry

Psychiatrists were forecast to contract by 5 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Psychiatrists predicted to decrease from 1,357 in 2005 to 1,294 in 2020. Adjusting for the projected population growth in the state, the Psychiatrist to population ratio was predicted to decrease from 13.3 physicians per 100,000 population to 12.1 physicians per 100,000 population.

Anesthesiology

Anesthesiologists were forecast to grow by 11 percent between 2005 and 2020, well above the overall predicted growth among non-primary care physicians, with the number of active Anesthesiologists predicted to increase from 1,292 in 2005 to 1,431 in 2020. Adjusting for the projected population growth in the state, the Anesthesiologist to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 13.4 physicians per 100,000 population.

Radiology

Radiologists were forecast to grow by 4 percent between 2005 and 2020, about the same as the overall predicted growth among non-primary care physicians, with the number of active Radiologists predicted to increase from 1,375 in 2005 to 1,436 in 2020. Adjusting for the projected population growth in the state, the Radiologist to population ratio was predicted to decline very slightly from 13.5 physicians per 100,000 population to 13.4 physicians per 100,000 population.

Emergency Medicine

Emergency Medicine physicians were forecast to grow by 25 percent between 2005 and 2020, far above the overall predicted growth among non-primary care physicians, with the number of active Emergency Medicine physicians predicted to increase from 1,655 in 2005 to 2,066 in 2020. Adjusting for the projected population growth in the state, the Emergency Medicine physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 19.3 physicians per 100,000 population.

Figure 24 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,352	10,428,683	13.0
2015	1,329	10,599,122	12.5
2020	1,294	10,695,993	12.1
Percent Change 2005-2020	-5%	5%	-9%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,376	10,428,683	13.2
2015	1,412	10,599,122	13.3
2020	1,431	10,695,993	13.4
Percent Change 2005-2020	11%	5%	6%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,440	10,428,683	13.8
2015	1,441	10,599,122	13.6
2020	1,436	10,695,993	13.4
Percent Change 2005-2020	4%	5%	0%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,841	10,428,683	17.7
2015	1,970	10,599,122	18.6
2020	2,066	10,695,993	19.3
Percent Change 2005-2020	25%	5%	19%

General Surgery

General Surgeons were forecast to contract by 2 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active General Surgeons predicted to decrease from 1,648 in 2005 to 1,610 in 2020. Adjusting for the projected population growth in the state, the General Surgeons to population ratio was predicted to decrease from 16.1 physicians per 100,000 population to 15.1 physicians per 100,000 population.

Ophthalmology

Ophthalmologists were forecast to contract by 6 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Ophthalmologists predicted to decrease from 668 in 2005 to 629 in 2020. Adjusting for the projected population growth in the state, the Ophthalmologist to population ratio was predicted to decrease from 6.5 physicians per 100,000 population to 5.9 physicians per 100,000 population.

Otolaryngology

Otolaryngologists were forecast to contract by 2 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Otolaryngologists predicted to decrease from 317 in 2005 to 311 in 2020. Adjusting for the projected population growth in the state, the Otolaryngologist to population ratio was predicted

to decrease slightly from 3.1 physicians per 100,000 population to 2.9 physicians per 100,000 population.

Orthopedic Surgery

Orthopedic Surgeons were forecast to contract by 2 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Orthopedic Surgeons predicted to decrease from 844 in 2005 to 829 in 2020. Adjusting for the projected population growth in the state, the Orthopedic Surgeon to population ratio was predicted to decrease from 8.3 physicians per 100,000 population to 7.7 physicians per 100,000 population.

Figure 25 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,681	10,428,683	16.1
2015	1,644	10,599,122	15.5
2020	1,610	10,695,993	15.1
Percent Change 2005-2020	-2%	5%	-7%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	671	10,428,683	6.4
2015	646	10,599,122	6.1
2020	629	10,695,993	5.9
Percent Change 2005-2020	-6%	5%	-10%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	320	10,428,683	3.1
2015	316	10,599,122	3.0
2020	311	10,695,993	2.9
Percent Change 2005-2020	-2%	5%	-6%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	857	10,428,683	8.2
2015	845	10,599,122	8.0
2020	829	10,695,993	7.7
Percent Change 2005-2020	-2%	5%	-6%

Urology

Urologists were forecast to remain essentially unchanged between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Urologists predicted to increase from 375 in 2005 to 374 in 2020. Adjusting for the projected population growth in the state, the Urologist to population ratio was predicted to decline slightly from 3.7 physicians per 100,000 population to 3.5 physicians per 100,000 population.

Other Surgery Subspecialties

Other Surgical Subspecialists were forecast to contract by 2 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active physicians predicted to increase from 568 in 2005 to 556 in 2020. Adjusting for the projected population growth in the state, the other Surgical Subspecialist to population ratio was predicted to decrease slightly from 5.6 physicians per 100,000 population to 5.2 physicians per 100,000 population.

Figure 26 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	388	10,428,683	3.7
2015	384	10,599,122	3.6
2020	374	10,695,993	3.5
Percent Change 2005-2020	0%	5%	-5%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	581	10,428,683	5.6
2015	570	10,599,122	5.4
2020	556	10,695,993	5.2
Percent Change 2005-2020	-2%	5%	-7%

State Level Supply Scenario 3: 10 percent Increase in Physician Productivity

In this scenario, the supply model forecast a 21 percent increase in the supply of physicians between 2005 and 2020, with the number of active physicians predicted to increase from 30,366 in 2005 to 36,809 in 2020. Adjusting for the projected population growth in the state (5 percent), the physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 344 physicians per 100,000 population.

Figure 27– Michigan Physician Supply Forecast, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,756	10,428,683	305
2015	34,455	10,599,122	325
2020	36,809	10,695,993	344
Percent Change 2005-2020	21%	5%	16%

Primary care physicians were forecast to grow by 21 percent between 2005 and 2020, with the number of active physicians predicted to increase from 11,744 in 2005 to 14,178 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to increase from 115 physicians per 100,000 population to 133 physicians per 100,000 population.

Non-primary care physicians were also forecast to grow by 22 percent between 2005 and 2020, with the number of active physicians predicted to increase from 18,622 in 2005 to 22,631 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 212 physicians per 100,000 population.

Figure 28 – Michigan Primary Care and Non-Primary Care Physician Supply Forecast, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	13,325	10,599,122	126
2020	14,178	10,695,993	133
Percent Change 2005-2020	21%	5%	15%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,449	10,428,683	186
2015	21,130	10,599,122	199
2020	22,631	10,695,993	212
Percent Change 2005-2020	22%	5%	16%

Specialty-Specific Supply Forecasts

In this scenario, the supply of physicians was forecast to grow very rapidly between 2005 and 2020. All specialties were forecast to grow. Cardiologists, Pathologists, and Ophthalmologists were forecast to grow the least rapidly (less than 10 percent), while General Internists, Internal Medicine Subspecialists (other than Cardiologists), Anesthesiologists, and Emergency Medicine physicians were forecast to grow most rapidly (more than 25 percent).

Primary Care Specialties

General/Family Medicine

General/Family Physicians were forecast to grow by 17 percent between 2005 and 2020, slightly below the overall predicted rate of growth among primary care physicians, with the number of active General/Family Physicians predicted to increase from 5,080 in 2005 to 5,962 in 2020. Adjusting for the projected population growth in the state, the General/Family Physician to population ratio was predicted to increase from 49.8 physicians per 100,000 population to 55.7 physicians per 100,000 population.

General Internal Medicine

General Internists were forecast to grow by 28 percent between 2005 and 2020, well above the overall predicted rate of growth among primary care physicians, with the number of active General Internists predicted to increase from 4,742 in 2005 to 6,078 in 2020. Adjusting for the projected population growth in the state, the General Internist to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 56.8 physicians per 100,000 population.

General Pediatrics

General Pediatricians were forecast to grow by 11 percent between 2005 and 2020, unlike the overall predicted rate of growth among primary care physicians, with the number of active General Pediatricians predicted to increase from 1,922 in 2005 to 2,138 in 2020. Adjusting for the projected population growth in the state, the General Pediatrician to population ratio was predicted to increase from 18.8 physicians per 100,000 population to 20.0 physicians per 100,000 population.

Figure 29 – Michigan Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	13,325	10,599,122	126
2020	14,178	10,695,993	133
Percent Change 2005-2020	21%	5%	15%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,222	10,428,683	50.1
2015	5,618	10,599,122	53.0
2020	5,962	10,695,993	55.7
Percent Change 2005-2020	17%	5%	12%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,127	10,428,683	49.2
2015	5,643	10,599,122	53.2
2020	6,078	10,695,993	56.8
Percent Change 2005-2020	28%	5%	22%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,958	10,428,683	18.8
2015	2,064	10,599,122	19.5
2020	2,138	10,695,993	20.0
Percent Change 2005-2020	11%	5%	6%

Non-Primary Care Specialties

Cardiovascular Disease

Cardiologists were forecast to grow by 4 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Cardiologists predicted to increase from 736 in 2005 to 763 in 2020. Adjusting for the projected population growth in the state, the Cardiologist to population ratio was predicted to decline very slightly from 7.2 physicians per 100,000 population to 7.1 physicians per 100,000 population.

Other Internal Medicine Subspecialties

Other Internal Medicine Subspecialists were forecast to grow by 28 percent between 2005 and 2020, somewhat above the overall predicted rate of growth among non-primary care physicians, with the number of active physicians predicted to increase from 2,970 in 2005 to 3,904 in 2020. Adjusting for the projected population growth in the state, the other Internal Medicine Subspecialist to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 36.5 physicians per 100,000 population.

Obstetrics and Gynecology

Obstetrician/Gynecologists were forecast to grow by 19 percent between 2005 and 2020, slightly below the overall predicted rate of growth among non-primary care physicians, with the number of active Obstetrician/Gynecologists predicted to increase from 1,712 in 2005 to 2,045 in 2020. Adjusting for the projected population growth in the state, the Obstetrician/Gynecologist to population ratio was predicted to increase from 16.8 physicians per 100,000 population to 19.1 physicians per 100,000 population.

Pathology

Pathologists were forecast to contract by 4 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Pathologists predicted to increase from 717 in 2005 to 743 in 2020. Adjusting for the projected population growth in the state, the Pathologist to population ratio was predicted to essentially be at the same level in 2020 (7.0 physicians per 100,000 population) as it was in 2005.

Figure 30 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	735	10,428,683	7.0
2015	758	10,599,122	7.2
2020	763	10,695,993	7.1
Percent Change 2005-2020	4%	5%	-1%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,190	10,428,683	30.6
2015	3,572	10,599,122	33.7
2020	3,904	10,695,993	36.5
Percent Change 2005-2020	31%	5%	25%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,790	10,428,683	17.2
2015	1,932	10,599,122	18.2
2020	2,045	10,695,993	19.1
Percent Change 2005-2020	19%	5%	14%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	702	10,428,683	6.7
2015	722	10,599,122	6.8
2020	743	10,695,993	7.0
Percent Change 2005-2020	4%	5%	-1%

Psychiatry

Psychiatrists were forecast to grow by 10 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Psychiatrists predicted to increase from 1,357 in 2005 to 1,498 in 2020. Adjusting for the projected population growth in the state, the Psychiatrist to population ratio was predicted to increase from 13.3 physicians per 100,000 population to 14.0 physicians per 100,000 population.

Anesthesiology

Anesthesiologists were forecast to grow by 28 percent between 2005 and 2020, well above the overall predicted growth among non-primary care physicians, with the number of active Anesthesiologists predicted to increase from 1,292 in 2005 to 1,657 in 2020. Adjusting for the projected population growth in the state, the Anesthesiologist to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 15.5 physicians per 100,000 population.

Radiology

Radiologists were forecast to grow by 21 percent between 2005 and 2020, about the same as the overall predicted growth among non-primary care physicians, with the number of active Radiologists predicted to increase from 1,375 in 2005 to 1,663 in 2020. Adjusting for the projected population growth in the state, the Radiologist to population ratio was predicted to grow from 13.5 physicians per 100,000 population to 15.5 physicians per 100,000 population.

Emergency Medicine

Emergency Medicine physicians were forecast to grow by 45 percent between 2005 and 2020, far above the overall predicted growth among non-primary care physicians, with the number of active Emergency Medicine physicians predicted to increase from 1,655 in 2005 to 2,392 in 2020. Adjusting for the projected population growth in the state, the Emergency Medicine

physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 22.4 physicians per 100,000 population.

Figure 31– Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,352	10,428,683	13.0
2015	1,431	10,599,122	13.5
2020	1,498	10,695,993	14.0
Percent Change 2005-2020	10%	5%	5%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,376	10,428,683	13.2
2015	1,520	10,599,122	14.3
2020	1,657	10,695,993	15.5
Percent Change 2005-2020	28%	5%	22%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,440	10,428,683	13.8
2015	1,551	10,599,122	14.6
2020	1,663	10,695,993	15.5
Percent Change 2005-2020	21%	5%	15%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,841	10,428,683	17.7
2015	2,121	10,599,122	20.0
2020	2,392	10,695,993	22.4
Percent Change 2005-2020	45%	5%	38%

General Surgery

General Surgeons were forecast to grow by 13 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active General Surgeons predicted to increase from 1,648 in 2005 to 1,864 in 2020. Adjusting for the projected population growth in the state, the General Surgeons to population ratio was predicted to grow from 16.1 physicians per 100,000 population to 17.4 physicians per 100,000 population.

Ophthalmology

Ophthalmologists were forecast to grow by 9 percent between 2005 and 2020, far below the overall predicted growth among non-primary care physicians, with the number of active Ophthalmologists predicted to increase from 668 in 2005 to 729 in 2020. Adjusting for the projected population growth in the state, the Ophthalmologist to population ratio was predicted to increase from 6.5 physicians per 100,000 population to 6.8 physicians per 100,000 population.

Otolaryngology

Otolaryngologists were forecast to increase by 14 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Otolaryngologists predicted to increase from 317 in 2005 to 360 in 2020. Adjusting for the projected population growth in the state, the Otolaryngologist to population ratio was predicted to increase slightly from 3.1 physicians per 100,000 population to 3.4 physicians per 100,000 population.

Orthopedic Surgery

Orthopedic Surgeons were forecast to increase by 14 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Orthopedic Surgeons predicted to increase from 844 in 2005 to 960 in 2020. Adjusting for the projected population growth in the state, the Orthopedic Surgeon to population ratio was predicted to increase from 8.3 physicians per 100,000 population to 9.0 physicians per 100,000 population.

Figure 32 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,681	10,428,683	16.1
2015	1,771	10,599,122	16.7
2020	1,864	10,695,993	17.4
Percent Change 2005-2020	13%	5%	8%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	671	10,428,683	6.4
2015	696	10,599,122	6.6
2020	729	10,695,993	6.8
Percent Change 2005-2020	9%	5%	4%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	320	10,428,683	3.1
2015	341	10,599,122	3.2
2020	360	10,695,993	3.4
Percent Change 2005-2020	14%	5%	8%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	857	10,428,683	8.2
2015	910	10,599,122	8.6
2020	960	10,695,993	9.0
Percent Change 2005-2020	14%	5%	8%

Urology

Urologists were forecast to grow by 15 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Urologists predicted to increase from 375 in 2005 to 433 in 2020. Adjusting for the projected population growth in the state, the Urologist to population ratio was predicted to increase from 3.7 physicians per 100,000 population to 4.0 physicians per 100,000 population.

Other Surgery Subspecialties

Other Surgical Subspecialists were forecast to increase by 13 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active physicians predicted to increase from 568 in 2005 to 644 in 2020. Adjusting for the projected population growth in the state, the other Surgical Subspecialist to population ratio was predicted to increase from 5.6 physicians per 100,000 population to 6.0 physicians per 100,000 population.

Figure 33 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	388	10,428,683	3.7
2015	414	10,599,122	3.9
2020	433	10,695,993	4.0
Percent Change 2005-2020	15%	5%	10%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	581	10,428,683	5.6
2015	614	10,599,122	5.8
2020	644	10,695,993	6.0
Percent Change 2005-2020	13%	5%	8%

State Level Supply Scenario 4: 10 percent Increase in Physician Productivity / 5 percent Reduction in Physician Effort

In this scenario, the supply model forecast a 16 percent increase in the supply of physicians between 2005 and 2020, with the number of active physicians predicted to increase from 30,366 in 2005 to 35,136 in 2020. Adjusting for the projected population growth in the state (5 percent), the physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 328 physicians per 100,000 population.

Figure 34 – Michigan Physician Supply Forecast, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,756	10,428,683	305
2015	33,635	10,599,122	317
2020	35,136	10,695,993	328
Percent Change 2005-2020	16%	5%	10%

Primary care physicians were forecast to grow by 15 percent between 2005 and 2020, with the number of active physicians predicted to increase from 11,744 in 2005 to 13,533 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to increase from 115 physicians per 100,000 population to 127 physicians per 100,000 population.

Non-primary care physicians were also forecast to grow by 16 percent between 2005 and 2020, with the number of active physicians predicted to increase from 18,622 in 2005 to 21,602 in 2020. Adjusting for the projected population growth in the state, the physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 202 physicians per 100,000 population.

Figure 35 – Michigan Primary Care and Non-Primary Care Physician Supply Forecast, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	13,008	10,599,122	123
2020	13,533	10,695,993	127
Percent Change 2005-2020	15%	5%	10%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,449	10,428,683	186
2015	20,627	10,599,122	195
2020	21,602	10,695,993	202
Percent Change 2005-2020	16%	5%	11%

Specialty-Specific Supply Forecasts

In this scenario, the rapid growth projected in the previous scenario was tempered by a reduction of hours worked among the increasingly productive physicians. Once again, almost all of the specialties were forecast to grow between 2005 and 2020 in this scenario. The only exceptions were Cardiologists and Pathologists. The forecast supply growth showed a great deal of variation with General Internists, Internal Medicine Subspecialists (other than Cardiologists), Anesthesiologists, and Emergency Medicine physicians growing at rates higher than the overall physician supply and General/Family Physicians, General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, Radiology, General Surgeons, Ophthalmologists, Otolaryngologists, Orthopedic Surgeons, Urologists, and other Surgical Subspecialists growing at rates lower than the overall physician supply.

Primary Care Specialties

General/Family Medicine

General/Family Physicians were forecast to grow by 12 percent between 2005 and 2020, slightly below the overall predicted rate of growth among primary care physicians, with the number of active General/Family Physicians predicted to increase from 5,080 in 2005 to 5,691 in 2020. Adjusting for the projected population growth in the state, the General/Family Physician to population ratio was predicted to increase from 49.8 physicians per 100,000 population to 53.2 physicians per 100,000 population.

General Internal Medicine

General Internists were forecast to grow by 22 percent between 2005 and 2020, well above the overall predicted rate of growth among primary care physicians, with the number of active General Internists predicted to increase from 4,742 in 2005 to 5,802 in 2020. Adjusting for the projected population growth in the state, the General Internist to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 54.2 physicians per 100,000 population.

General Pediatrics

General Pediatricians were forecast to grow by 6 percent between 2005 and 2020, well below the overall predicted rate of growth among primary care physicians, with the number of active General Pediatricians predicted to increase from 1,922 in 2005 to 2,041 in 2020. Adjusting for

the projected population growth in the state, the General Pediatrician to population ratio was predicted to increase slightly from 18.8 physicians per 100,000 population to 19.1 physicians per 100,000 population.

Figure 36 – Michigan Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,307	10,428,683	118
2015	13,008	10,599,122	123
2020	13,533	10,695,993	127
Percent Change 2005-2020	15%	5%	10%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,222	10,428,683	50.1
2015	5,484	10,599,122	51.7
2020	5,691	10,695,993	53.2
Percent Change 2005-2020	12%	5%	7%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,127	10,428,683	49.2
2015	5,509	10,599,122	52.0
2020	5,802	10,695,993	54.2
Percent Change 2005-2020	22%	5%	17%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,958	10,428,683	18.8
2015	2,015	10,599,122	19.0
2020	2,041	10,695,993	19.1
Percent Change 2005-2020	6%	5%	1%

Non-Primary Care Specialties

Cardiovascular Disease

Cardiologists were forecast to contract by 1 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Cardiologists predicted to decrease from 736 in 2005 to 728 in 2020. Adjusting for the projected population growth in the state, the Cardiologist to population ratio was predicted to decline from 7.2 physicians per 100,000 population to 6.8 physicians per 100,000 population.

Other Internal Medicine Subspecialties

Other Internal Medicine Subspecialists were forecast to grow by 25 percent between 2005 and 2020, well above the overall predicted rate of growth among non-primary care physicians, with the number of active physicians predicted to increase from 2,970 in 2005 to 3,727 in 2020. Adjusting for the projected population growth in the state, the other Internal Medicine Subspecialist to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 34.8 physicians per 100,000 population.

Obstetrics and Gynecology

Obstetrician/Gynecologists were forecast to grow by 14 percent between 2005 and 2020, slightly below the overall predicted rate of growth among non-primary care physicians, with the number of active Obstetrician/Gynecologists predicted to increase from 1,712 in 2005 to 1,953 in 2020. Adjusting for the projected population growth in the state, the Obstetrician/Gynecologist to population ratio was predicted to increase from 16.8 physicians per 100,000 population to 18.3 physicians per 100,000 population.

Pathology

Pathologists were forecast to contract by 1 percent between 2005 and 2020, unlike the overall predicted growth among non-primary care physicians, with the number of active Pathologists predicted to decrease from 717 in 2005 to 710 in 2020. Adjusting for the projected population growth in the state, the Pathologist to population ratio was predicted to decrease from 7.0 physicians per 100,000 population to 6.6 physicians per 100,000 population.

Figure 37 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	735	10,428,683	7.0
2015	740	10,599,122	7.0
2020	728	10,695,993	6.8
Percent Change 2005-2020	-1%	5%	-6%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,190	10,428,683	30.6
2015	3,487	10,599,122	32.9
2020	3,727	10,695,993	34.8
Percent Change 2005-2020	25%	5%	20%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,790	10,428,683	17.2
2015	1,886	10,599,122	17.8
2020	1,953	10,695,993	18.3
Percent Change 2005-2020	14%	5%	9%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	702	10,428,683	6.7
2015	705	10,599,122	6.7
2020	710	10,695,993	6.6
Percent Change 2005-2020	-1%	5%	-6%

Psychiatry

Psychiatrists were forecast to grow by 5 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Psychiatrists predicted to increase from 1,357 in 2005 to 1,430 in 2020. Adjusting for the projected population growth in the state, the Psychiatrist to population ratio was predicted to increase very slightly from 13.3 physicians per 100,000 population to 13.4 physicians per 100,000 population.

Anesthesiology

Anesthesiologists were forecast to grow by 22 percent between 2005 and 2020, somewhat above the overall predicted growth among non-primary care physicians, with the number of active Anesthesiologists predicted to increase from 1,292 in 2005 to 1,582 in 2020. Adjusting for the projected population growth in the state, the Anesthesiologist to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 14.8 physicians per 100,000 population.

Radiology

Radiologists were forecast to grow by 15 percent between 2005 and 2020, about the same as the overall predicted growth among non-primary care physicians, with the number of active Radiologists predicted to increase from 1,375 in 2005 to 1,587 in 2020. Adjusting for the projected population growth in the state, the Radiologist to population ratio was predicted to grow from 13.5 physicians per 100,000 population to 14.8 physicians per 100,000 population.

Emergency Medicine

Emergency Medicine physicians were forecast to grow by 38 percent between 2005 and 2020, far above the overall predicted growth among non-primary care physicians, with the number of active Emergency Medicine physicians predicted to increase from 1,655 in 2005 to 2,284 in 2020. Adjusting for the projected population growth in the state, the Emergency Medicine physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 21.4 physicians per 100,000 population.

Figure 38 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,352	10,428,683	13.0
2015	1,397	10,599,122	13.2
2020	1,430	10,695,993	13.4
Percent Change 2005-2020	5%	5%	1%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,376	10,428,683	13.2
2015	1,484	10,599,122	14.0
2020	1,582	10,695,993	14.8
Percent Change 2005-2020	22%	5%	17%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,440	10,428,683	13.8
2015	1,514	10,599,122	14.3
2020	1,587	10,695,993	14.8
Percent Change 2005-2020	15%	5%	10%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,841	10,428,683	17.7
2015	2,071	10,599,122	19.5
2020	2,284	10,695,993	21.4
Percent Change 2005-2020	38%	5%	32%

General Surgery

General Surgeons were forecast to grow by 8 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active General Surgeons predicted to increase from 1,648 in 2005 to 1,779 in 2020. Adjusting for the projected population growth in the state, the General Surgeons to population ratio was predicted to grow from 16.1 physicians per 100,000 population to 16.6 physicians per 100,000 population.

Ophthalmology

Ophthalmologists were forecast to grow by 4 percent between 2005 and 2020, far below the overall predicted growth among non-primary care physicians, with the number of active Ophthalmologists predicted to increase from 668 in 2005 to 696 in 2020. Adjusting for the projected population growth in the state, the Ophthalmologist to population ratio was predicted to remain about the same in 2020 as it was in 2005 (6.5 physicians per 100,000 population.

Otolaryngology

Otolaryngologists were forecast to increase by 8 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active

Otolaryngologists predicted to increase from 317 in 2005 to 344 in 2020. Adjusting for the projected population growth in the state, the Otolaryngologist to population ratio was predicted to increase slightly from 3.1 physicians per 100,000 population to 3.2 physicians per 100,000 population.

Orthopedic Surgery

Orthopedic Surgeons were forecast to increase by 8 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active Orthopedic Surgeons predicted to increase from 844 in 2005 to 916 in 2020. Adjusting for the projected population growth in the state, the Orthopedic Surgeon to population ratio was predicted to increase from 8.3 physicians per 100,000 population to 8.6 physicians per 100,000 population.

Figure 39 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,681	10,428,683	16.1
2015	1,729	10,599,122	16.3
2020	1,779	10,695,993	16.6
Percent Change 2005-2020	8%	5%	3%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	671	10,428,683	6.4
2015	679	10,599,122	6.4
2020	696	10,695,993	6.5
Percent Change 2005-2020	4%	5%	-1%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	320	10,428,683	3.1
2015	333	10,599,122	3.1
2020	344	10,695,993	3.2
Percent Change 2005-2020	8%	5%	3%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	857	10,428,683	8.2
2015	888	10,599,122	8.4
2020	916	10,695,993	8.6
Percent Change 2005-2020	8%	5%	4%

Urology

Urologists were forecast to grow by 10 percent between 2005 and 2020, somewhat below the overall predicted growth among non-primary care physicians, with the number of active Urologists predicted to increase from 375 in 2005 to 413 in 2020. Adjusting for the projected population growth in the state, the Urologist to population ratio was predicted to increase from 3.7 physicians per 100,000 population to 3.9 physicians per 100,000 population.

Other Surgery Subspecialties

Other Surgical Subspecialists were forecast to increase by 8 percent between 2005 and 2020, well below the overall predicted growth among non-primary care physicians, with the number of active physicians predicted to increase from 568 in 2005 to 615 in 2020. Adjusting for the projected population growth in the state, the other Surgical Subspecialist to population ratio was predicted to increase from 5.6 physicians per 100,000 population to 5.7 physicians per 100,000 population.

Figure 40 – Michigan Non-Primary Care Physician Supply: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	388	10,428,683	3.7
2015	404	10,599,122	3.8
2020	413	10,695,993	3.9
Percent Change 2005-2020	10%	5%	5%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	581	10,428,683	5.6
2015	599	10,599,122	5.7
2020	615	10,695,993	5.7
Percent Change 2005-2020	8%	5%	3%

Regional Physician Supply, 2005-2020

Regional physician supply forecasts were generated under two scenarios. The first assumed that physicians would locate their practices as they had in the past, without regard to how demand for their services might change in the future. The effect of this assumption was that relative physician supply growth (i.e., the percentage growth between 2005 and 2020) is equal to the overall physician supply growth in the state and more or less equal across regions.

The second regional supply forecast scenario assumed that physicians would locate their practice in the future in a way that corresponded to how demand was predicted to change. In other words, physicians would move from areas with declining demand to areas with growing demand. As a result, the scenario more or less equalizes and minimizes imbalances between supply and demand across all regions.

In order to keep the sheer volume of forecast values manageable, Supply Scenario 1 was used as the basis for the regional supply forecasts.

Regional Supply Scenario 1: Supply Non-Responsive to Demand

In this scenario, regional supplies of physicians were forecast to increase between 9 and 11 percent. Due to the variable rates of population growth, the physician to population ratio was predicted to decrease in a number of regions (Ann Arbor Area, Grand Rapids-Muskegon, and Northwest regions), while it was predicted to increase in most others (Detroit Area, East Central, Flint Area, Jackson Area, Kalamazoo-Battle Creek, Lansing Area, Northeast, Saginaw-Thumb, Southwest Michigan, Upper Peninsula, and West Central regions).

In terms of specialty-specific supply forecasts, most specialties were forecast to increase in number as they were in the statewide forecasts, with the exception of Cardiology, Pathology, and Ophthalmology. However, due to the variation in rates of population growth, in a number of regions, quite a number of specialties were forecast to contract in terms of ratios of physicians to population. The three specialties mentioned above were forecast to decline in every region, but General Pediatrics, Psychiatry, General Surgery, Otolaryngology, Orthopedic Surgery, and other surgical specialties were also among the most frequently forecast to decline regionally. The populations in the Ann Arbor Area, Grand Rapids-Muskegon, and Northwest regions were forecast to grow at the greatest rate, and hence those regions were forecast to have the greatest degree of decline in the aforementioned specialties. The Ann Arbor Area and Northwest regions

were forecast to experience an increase in the physician-to-population ratio in only two specialties, Emergency Medicine and Internal Medicine Subspecialties (other than Cardiology).

Figure 41 – Ann Arbor Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**3,546**	**672**	**3,924**	**637**	**11%**	**-5%**
Primary Care	*988*	*187*	*1,096*	*178*	*11%*	*-5%*
General/Family Medicine	234	44	250	41	7%	-9%
General Internal Medicine	543	103	633	103	17%	0%
General Pediatrics	211	40	213	35	1%	-13%
Non-Primary Care	*2,557*	*485*	*2,828*	*459*	*11%*	*-5%*
Cardiovascular Diseases	89	17	84	14	-6%	-19%
Other Internal Medicine Subspecialties	532	101	635	103	20%	2%
Obstetrics and Gynecology	154	29	167	27	9%	-7%
Pathology	117	22	110	18	-6%	-19%
Psychiatry	221	42	222	36	0%	-14%
Anesthesiology	183	35	213	35	17%	0%
Radiology	160	30	176	28	10%	-6%
Emergency Medicine	149	28	196	32	31%	13%
General Surgery	182	34	187	30	3%	-12%
Ophthalmology	66	12	65	11	-1%	-15%
Otolaryngology	45	8	46	7	3%	-12%
Orthopedic Surgery	88	17	91	15	3%	-12%
Urology	50	9	52	9	5%	-10%
Other Surgical Specialties	93	18	96	16	3%	-12%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 42 – Detroit Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**14,632**	**342**	**16,142**	**371**	**10%**	**9%**
Primary Care	*5,518*	*129*	*6,085*	*140*	*10%*	*9%*
General/Family Medicine	1,934	45	2,063	47	7%	5%
General Internal Medicine	2,579	60	3,005	69	17%	15%
General Pediatrics	1,006	24	1,017	23	1%	0%
Non-Primary Care	*9,114*	*213*	*10,057*	*231*	*10%*	*9%*
Cardiovascular Diseases	369	9	348	8	-6%	-7%
Other Internal Medicine Subspecialties	1,489	35	1,779	41	20%	18%
Obstetrics and Gynecology	886	21	962	22	9%	7%
Pathology	374	9	352	8	-6%	-7%
Psychiatry	657	15	659	15	0%	-1%
Anesthesiology	574	13	670	15	17%	15%
Radiology	686	16	754	17	10%	8%
Emergency Medicine	750	18	985	23	31%	29%
General Surgery	802	19	825	19	3%	1%
Ophthalmology	348	8	345	8	-1%	-2%
Otolaryngology	141	3	145	3	3%	2%
Orthopedic Surgery	358	8	370	9	3%	2%
Urology	181	4	190	4	5%	3%
Other Surgical Specialties	266	6	274	6	3%	2%
			Projected Regional Population Change 2005-2020:			*2%*

Figure 43– East Central Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**151**	**100**	**167**	**101**	**10%**	**1%**
Primary Care	*88*	*59*	*96*	*59*	*9%*	*0%*
General/Family Medicine	55	37	59	36	7%	-3%
General Internal Medicine	26	18	31	19	17%	6%
General Pediatrics	7	4	7	4	1%	-8%
Non-Primary Care	*63*	*42*	*70*	*43*	*12%*	*2%*
Cardiovascular Diseases	1	1	1	1	-6%	-14%
Other Internal Medicine Subspecialties	12	8	14	9	20%	9%
Obstetrics and Gynecology	9	6	9	6	9%	-1%
Pathology	3	2	3	2	-6%	-14%
Psychiatry	2	1	2	1	0%	-8%
Anesthesiology	2	1	3	2	17%	7%
Radiology	1	1	1	1	10%	0%
Emergency Medicine	11	7	14	9	31%	20%
General Surgery	11	7	11	7	3%	-6%
Ophthalmology	2	1	2	1	-1%	-9%
Otolaryngology	4	3	4	3	3%	-6%
Orthopedic Surgery	0	0	0	0	--	--
Urology	1	1	1	1	5%	-4%
Other Surgical Specialties	1	1	1	1	3%	-6%
			Projected Regional Population Change 2005-2020:			*9%*

Figure 44 – Flint Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,425**	**276**	**1,568**	**309**	**10%**	**12%**
Primary Care	*748*	*145*	*821*	*162*	*10%*	*12%*
General/Family Medicine	376	73	401	79	7%	9%
General Internal Medicine	286	55	333	66	17%	19%
General Pediatrics	86	17	87	17	1%	3%
Non-Primary Care	*676*	*131*	*746*	*147*	*10%*	*12%*
Cardiovascular Diseases	27	5	26	5	-6%	-4%
Other Internal Medicine Subspecialties	121	23	145	29	20%	22%
Obstetrics and Gynecology	79	15	86	17	9%	11%
Pathology	25	5	24	5	-6%	-4%
Psychiatry	34	7	35	7	0%	2%
Anesthesiology	47	9	54	11	17%	19%
Radiology	79	15	87	17	10%	12%
Emergency Medicine	48	9	63	12	31%	34%
General Surgery	63	12	64	13	3%	5%
Ophthalmology	19	4	18	4	-1%	1%
Otolaryngology	12	2	12	2	3%	5%
Orthopedic Surgery	34	6	35	7	3%	5%
Urology	10	2	11	2	5%	7%
Other Surgical Specialties	22	4	23	4	3%	5%
			Projected Regional Population Change 2005-2020:			*-2%*

Figure 45 – Grand Rapids-Muskegon Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**2,756**	**233**	**3,036**	**224**	**10%**	**-4%**
Primary Care	*1,053*	*89*	*1,147*	*85*	*9%*	*-5%*
General/Family Medicine	547	46	583	43	7%	-7%
General Internal Medicine	333	28	388	29	17%	2%
General Pediatrics	173	15	175	13	1%	-12%
Non-Primary Care	*1,702*	*144*	*1,889*	*140*	*11%*	*-3%*
Cardiovascular Diseases	45	4	42	3	-6%	-18%
Other Internal Medicine Subspecialties	221	19	264	20	20%	4%
Obstetrics and Gynecology	180	15	196	14	9%	-5%
Pathology	54	5	51	4	-6%	-18%
Psychiatry	85	7	85	6	0%	-12%
Anesthesiology	157	13	183	14	17%	2%
Radiology	129	11	142	10	10%	-4%
Emergency Medicine	195	16	256	19	31%	15%
General Surgery	165	14	169	13	3%	-10%
Ophthalmology	64	5	63	5	-1%	-13%
Otolaryngology	30	3	31	2	3%	-10%
Orthopedic Surgery	116	10	120	9	3%	-10%
Urology	38	3	40	3	5%	-8%
Other Surgical Specialties	70	6	72	5	3%	-10%
			Projected Regional Population Change 2005-2020:			*14%*

Figure 46 – Jackson Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**605**	**130**	**662**	**138**	**10%**	**6%**
Primary Care	*253*	*54*	*275*	*57*	*9%*	*5%*
General/Family Medicine	135	29	144	30	7%	3%
General Internal Medicine	79	17	92	19	17%	12%
General Pediatrics	39	8	39	8	1%	-2%
Non-Primary Care	*352*	*76*	*387*	*80*	*10%*	*6%*
Cardiovascular Diseases	17	4	16	3	-6%	-9%
Other Internal Medicine Subspecialties	54	12	65	13	20%	15%
Obstetrics and Gynecology	29	6	32	7	9%	5%
Pathology	12	3	11	2	-6%	-9%
Psychiatry	31	7	31	6	0%	-3%
Anesthesiology	30	6	35	7	17%	12%
Radiology	22	5	24	5	10%	6%
Emergency Medicine	31	7	41	8	31%	27%
General Surgery	32	7	33	7	3%	-1%
Ophthalmology	18	4	18	4	-1%	-4%
Otolaryngology	10	2	11	2	3%	0%
Orthopedic Surgery	17	4	18	4	3%	0%
Urology	7	2	8	2	5%	1%
Other Surgical Specialties	4	1	4	1	3%	-1%
			Projected Regional Population Change 2005-2020:			*4%*

Figure 47 – Kalamazoo-Battle Creek Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,521**	**275**	**1,679**	**292**	**10%**	**6%**
Primary Care	*576*	*104*	*629*	*109*	*9%*	*5%*
General/Family Medicine	254	46	271	47	7%	3%
General Internal Medicine	214	39	250	43	17%	12%
General Pediatrics	107	19	108	19	1%	-3%
Non-Primary Care	*945*	*171*	*1,050*	*183*	*11%*	*7%*
Cardiovascular Diseases	38	7	36	6	-6%	-9%
Other Internal Medicine Subspecialties	146	26	174	30	20%	15%
Obstetrics and Gynecology	69	12	75	13	9%	5%
Pathology	27	5	26	4	-6%	-9%
Psychiatry	99	18	100	17	0%	-3%
Anesthesiology	51	9	60	10	17%	12%
Radiology	53	9	58	10	10%	6%
Emergency Medicine	127	23	167	29	31%	27%
General Surgery	83	15	85	15	3%	-1%
Ophthalmology	30	5	30	5	-1%	-4%
Otolaryngology	15	3	16	3	3%	0%
Orthopedic Surgery	60	11	62	11	3%	0%
Urology	17	3	18	3	5%	1%
Other Surgical Specialties	28	5	29	5	3%	-1%
		Projected Regional Population Change 2005-2020:				*4%*

Figure 48 – Lansing Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,523**	**330**	**1,672**	**347**	**10%**	**5%**
Primary Care	*629*	*136*	*682*	*141*	*8%*	*4%*
General/Family Medicine	334	72	357	74	7%	2%
General Internal Medicine	181	39	210	44	17%	11%
General Pediatrics	114	25	115	24	1%	-3%
Non-Primary Care	*894*	*194*	*990*	*205*	*11%*	*6%*
Cardiovascular Diseases	43	9	41	8	-6%	-10%
Other Internal Medicine Subspecialties	119	26	143	30	20%	14%
Obstetrics and Gynecology	86	19	93	19	9%	4%
Pathology	23	5	22	4	-6%	-10%
Psychiatry	95	21	95	20	0%	-4%
Anesthesiology	61	13	71	15	17%	12%
Radiology	54	12	60	12	10%	5%
Emergency Medicine	98	21	129	27	31%	26%
General Surgery	68	15	70	14	3%	-2%
Ophthalmology	27	6	27	6	-1%	-5%
Otolaryngology	11	2	11	2	3%	-1%
Orthopedic Surgery	35	7	36	7	3%	-1%
Urology	15	3	15	3	5%	0%
Other Surgical Specialties	24	5	25	5	3%	-1%
		Projected Regional Population Change 2005-2020:				*5%*

Figure 49– Northeast Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**243**	**170**	**268**	**172**	**10%**	**1%**
Primary Care	*124*	*87*	*135*	*87*	*9%*	*0%*
General/Family Medicine	79	55	85	54	7%	-2%
General Internal Medicine	34	24	40	26	17%	7%
General Pediatrics	11	8	11	7	1%	-7%
Non-Primary Care	*119*	*83*	*133*	*85*	*11%*	*2%*
Cardiovascular Diseases	2	1	2	1	-6%	-13%
Other Internal Medicine Subspecialties	12	8	14	9	20%	10%
Obstetrics and Gynecology	11	8	12	8	9%	0%
Pathology	5	4	5	3	-6%	-13%
Psychiatry	4	3	4	3	0%	-8%
Anesthesiology	12	8	14	9	17%	7%
Radiology	9	6	9	6	10%	1%
Emergency Medicine	18	12	23	15	31%	21%
General Surgery	18	12	18	12	3%	-6%
Ophthalmology	2	1	2	1	-1%	-9%
Otolaryngology	1	1	1	1	3%	-5%
Orthopedic Surgery	13	9	14	9	3%	-5%
Urology	4	3	5	3	5%	-4%
Other Surgical Specialties	0	0	0	0	--	--
			Projected Regional Population Change 2005-2020:			*9%*

Figure 50 – Northwest Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**853**	**286**	**934**	**267**	**10%**	**-7%**
Primary Care	*341*	*114*	*372*	*106*	*9%*	*-7%*
General/Family Medicine	204	68	218	62	7%	-9%
General Internal Medicine	103	35	120	34	17%	-1%
General Pediatrics	33	11	34	10	1%	-14%
Non-Primary Care	*512*	*172*	*562*	*161*	*10%*	*-6%*
Cardiovascular Diseases	23	8	22	6	-6%	-20%
Other Internal Medicine Subspecialties	56	19	67	19	20%	2%
Obstetrics and Gynecology	41	14	45	13	9%	-7%
Pathology	21	7	20	6	-6%	-20%
Psychiatry	36	12	36	10	0%	-14%
Anesthesiology	49	17	57	16	17%	-1%
Radiology	37	12	41	12	10%	-6%
Emergency Medicine	50	17	66	19	31%	12%
General Surgery	47	16	48	14	3%	-12%
Ophthalmology	25	8	25	7	-1%	-16%
Otolaryngology	10	3	10	3	3%	-12%
Orthopedic Surgery	33	11	34	10	3%	-12%
Urology	11	4	12	3	5%	-11%
Other Surgical Specialties	19	6	20	6	3%	-12%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 51 – Saginaw-Thumb Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,534**	**242**	**1,687**	**264**	**10%**	**9%**
Primary Care	*654*	*103*	*713*	*111*	*9%*	*8%*
General/Family Medicine	412	65	439	69	7%	6%
General Internal Medicine	183	29	213	33	17%	15%
General Pediatrics	60	9	60	9	1%	0%
Non-Primary Care	*880*	*139*	*974*	*152*	*11%*	*10%*
Cardiovascular Diseases	44	7	41	6	-6%	-7%
Other Internal Medicine Subspecialties	98	15	117	18	20%	18%
Obstetrics and Gynecology	78	12	85	13	9%	8%
Pathology	24	4	23	4	-6%	-7%
Psychiatry	48	8	48	8	0%	-1%
Anesthesiology	70	11	82	13	17%	16%
Radiology	79	12	87	14	10%	9%
Emergency Medicine	107	17	140	22	31%	30%
General Surgery	82	13	84	13	3%	2%
Ophthalmology	36	6	36	6	-1%	-2%
Otolaryngology	20	3	21	3	3%	2%
Orthopedic Surgery	49	8	51	8	3%	2%
Urology	23	4	24	4	5%	4%
Other Surgical Specialties	24	4	25	4	3%	2%
			Projected Regional Population Change 2005-2020:			*1%*

Figure 52 – Southwest Michigan Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**397**	**136**	**434**	**150**	**9%**	**10%**
Primary Care	*188*	*64*	*205*	*71*	*9%*	*10%*
General/Family Medicine	107	37	115	39	7%	7%
General Internal Medicine	56	19	65	23	17%	17%
General Pediatrics	25	8	25	9	1%	2%
Non-Primary Care	*209*	*72*	*229*	*79*	*10%*	*10%*
Cardiovascular Diseases	14	5	13	4	-6%	-5%
Other Internal Medicine Subspecialties	32	11	39	13	20%	20%
Obstetrics and Gynecology	25	9	28	10	9%	9%
Pathology	7	2	7	2	-6%	-5%
Psychiatry	8	3	8	3	0%	1%
Anesthesiology	20	7	23	8	17%	17%
Radiology	17	6	19	7	10%	11%
Emergency Medicine	16	5	21	7	31%	32%
General Surgery	25	9	26	9	3%	3%
Ophthalmology	8	3	8	3	-1%	0%
Otolaryngology	5	2	5	2	3%	4%
Orthopedic Surgery	8	3	9	3	3%	4%
Urology	5	2	5	2	5%	6%
Other Surgical Specialties	6	2	6	2	3%	4%
			Projected Regional Population Change 2005-2020:			*-1%*

Figure 53 – Upper Peninsula Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**700**	**223**	**764**	**246**	**9%**	**10%**
Primary Care	*336*	*107*	*363*	*117*	*8%*	*9%*
General/Family Medicine	239	76	255	82	7%	8%
General Internal Medicine	65	21	76	24	17%	18%
General Pediatrics	31	10	32	10	1%	2%
Non-Primary Care	*364*	*116*	*400*	*129*	*10%*	*11%*
Cardiovascular Diseases	12	4	11	4	-6%	-5%
Other Internal Medicine Subspecialties	53	17	63	20	20%	21%
Obstetrics and Gynecology	34	11	37	12	9%	10%
Pathology	16	5	15	5	-6%	-5%
Psychiatry	26	8	26	8	0%	1%
Anesthesiology	22	7	26	8	17%	18%
Radiology	30	9	33	11	10%	11%
Emergency Medicine	31	10	40	13	31%	33%
General Surgery	39	12	40	13	3%	4%
Ophthalmology	16	5	16	5	-1%	0%
Otolaryngology	9	3	9	3	3%	4%
Orthopedic Surgery	17	5	18	6	3%	4%
Urology	7	2	8	2	5%	6%
Other Surgical Specialties	8	3	8	3	3%	4%
			Projected Regional Population Change 2005-2020:			*-1%*

Figure 54 – West Central Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**481**	**123**	**526**	**124**	**9%**	**1%**
Primary Care	*247*	*63*	*268*	*63*	*9%*	*0%*
General/Family Medicine	168	43	179	42	7%	-2%
General Internal Medicine	60	15	70	16	17%	7%
General Pediatrics	19	5	19	5	1%	-7%
Non-Primary Care	*234*	*60*	*257*	*61*	*10%*	*1%*
Cardiovascular Diseases	11	3	11	2	-6%	-13%
Other Internal Medicine Subspecialties	26	7	31	7	20%	10%
Obstetrics and Gynecology	30	8	33	8	9%	0%
Pathology	8	2	8	2	-6%	-13%
Psychiatry	11	3	11	3	0%	-8%
Anesthesiology	13	3	15	4	17%	7%
Radiology	20	5	22	5	10%	1%
Emergency Medicine	25	6	33	8	31%	21%
General Surgery	33	8	34	8	3%	-5%
Ophthalmology	6	2	6	1	-1%	-9%
Otolaryngology	3	1	3	1	3%	-5%
Orthopedic Surgery	16	4	17	4	3%	-5%
Urology	5	1	6	1	5%	-3%
Other Surgical Specialties	1	0	1	0	3%	-5%
			Projected Regional Population Change 2005-2020:			*9%*

Regional Supply Scenario 2: Supply Responsive to Demand

In this scenario, regional supplies of physicians were forecast to increase between 3 and 27 percent. The greatest rates of growth (over 20 percent) were forecast for the Ann Arbor Area and Northwest regions. The smallest rates of growth (3 percent) were forecast for the Flint Area and Southwest Michigan regions. Moreover, the physician to population ratio was predicted to increase in all regions at rates ranging from 3 and 9 percent. Regions that were forecast to experience the greatest rates of population growth were also forecast to experience the greatest rates of growth in regional physician to population ratio. The Ann Arbor and Northwest regions were forecast to experience the greatest rates of growth in the physician to population ratio (9 percent and 8 percent, respectively), followed by the Lansing Area, Saginaw-Thumb, and Upper Peninsula regions (7 percent each). The Detroit Area and Grand Rapids-Muskegon regions were forecast to experience the least growth in the physician-to-population ratio (3 percent).

In terms of specialty-specific supply forecasts, significant variation was forecast across regions. Regions forecast to experience the greatest rates of population growth were most likely to be forecast to experience the greatest rates of growth across specialties. For example, the Ann Arbor Area region was forecast to experience the greatest rate of growth in population and was forecast to experience rates of physician supply growth greater than 10 percent in all but a few specialties. However, in a number of these regions, the forecast growth in the number of physicians could not keep up with the forecast growth of the population. For instance, another region forecast to experience very high rates of population growth, the Northwest region, while forecast to experience rates of growth in many specialties of higher than 10 percent, was also forecast to experience declines in the physician to population ratio in several of those specialties, including Pathology, Psychiatry, Ophthalmology, and Urology. Further, even in specialties that were not forecast to decline, in this region (and others like it), the growth of the physician to population ratio was minimal.

It was particularly interesting to examine the forecasts of physician supply for the Detroit Area and Flint Area regions. Both of these regions were forecast to change very little in terms of population (2 percent growth and 2 percent decline, respectively), and thus both were forecast to experience very little growth in overall physician supply. However, examining the change across specialties, the findings were somewhat different. In all but the very fastest growing specialties, there were declines in the specialty-specific supply of physicians. For example, in the Detroit Area region, the supplies of Pediatricians, Cardiologists, Pathologists, Psychiatrists, General Surgeons, Ophthalmologists, Otolaryngologists, Orthopedic Surgeons, Urologists, and other surgical specialists were all forecast to decrease in number. Further, the physician to population ratios in these specialties were also forecast to decrease.

Figure 55 – Ann Arbor Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**3,546**	**672**	**4,508**	**732**	**27%**	**9%**
Primary Care	*988*	*187*	*1,266*	*206*	*28%*	*10%*
General/Family Medicine	234	44	286	46	22%	4%
General Internal Medicine	543	103	741	120	36%	17%
General Pediatrics	211	40	239	39	13%	-3%
Non-Primary Care	*2,557*	*485*	*3,242*	*526*	*27%*	*9%*
Cardiovascular Diseases	89	17	102	17	14%	-2%
Other Internal Medicine Subspecialties	532	101	737	120	39%	19%
Obstetrics and Gynecology	154	29	186	30	21%	3%
Pathology	117	22	126	20	7%	-8%
Psychiatry	221	42	247	40	12%	-4%
Anesthesiology	183	35	245	40	34%	15%
Radiology	160	30	206	33	29%	10%
Emergency Medicine	149	28	219	36	47%	26%
General Surgery	182	34	217	35	20%	3%
Ophthalmology	66	12	78	13	18%	1%
Otolaryngology	45	8	50	8	12%	-4%
Orthopedic Surgery	88	17	103	17	17%	0%
Urology	50	9	61	10	23%	5%
Other Surgical Specialties	93	18	109	18	16%	0%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 56 – Detroit Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**14,632**	**342**	**15,352**	**353**	**5%**	**3%**
Primary Care	*5,518*	*129*	*5,831*	*134*	*6%*	*4%*
General/Family Medicine	1,934	45	1,984	46	3%	1%
General Internal Medicine	2,579	60	2,866	66	11%	9%
General Pediatrics	1,006	24	981	23	-2%	-4%
Non-Primary Care	*9,114*	*213*	*9,521*	*219*	*4%*	*3%*
Cardiovascular Diseases	369	9	325	7	-12%	-13%
Other Internal Medicine Subspecialties	1,489	35	1,666	38	12%	10%
Obstetrics and Gynecology	886	21	937	22	6%	4%
Pathology	374	9	332	8	-11%	-12%
Psychiatry	657	15	628	14	-4%	-6%
Anesthesiology	574	13	628	14	9%	8%
Radiology	686	16	712	16	4%	2%
Emergency Medicine	750	18	948	22	26%	24%
General Surgery	802	19	782	18	-3%	-4%
Ophthalmology	348	8	325	7	-7%	-8%
Otolaryngology	141	3	138	3	-2%	-4%
Orthopedic Surgery	358	8	348	8	-3%	-4%
Urology	181	4	179	4	-1%	-3%
Other Surgical Specialties	266	6	256	6	-4%	-5%
			Projected Regional Population Change 2005-2020:			*2%*

Figure 57 – East Central Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**151**	**100**	**174**	**106**	**15%**	**5%**
Primary Care	*88*	*59*	*101*	*61*	*15%*	*5%*
General/Family Medicine	55	37	62	38	13%	3%
General Internal Medicine	26	18	32	20	23%	12%
General Pediatrics	7	4	6	4	-2%	-10%
Non-Primary Care	*63*	*42*	*73*	*44*	*16%*	*6%*
Cardiovascular Diseases	1	1	1	1	-2%	-11%
Other Internal Medicine Subspecialties	12	8	15	9	26%	15%
Obstetrics and Gynecology	9	6	9	6	8%	-2%
Pathology	3	2	3	2	-6%	-14%
Psychiatry	2	1	2	1	8%	-1%
Anesthesiology	2	1	3	2	21%	11%
Radiology	1	1	1	1	14%	4%
Emergency Medicine	11	7	15	9	41%	28%
General Surgery	11	7	12	7	6%	-3%
Ophthalmology	2	1	2	1	2%	-7%
Otolaryngology	4	3	4	2	-7%	-15%
Orthopedic Surgery	0	0	0	0	--	--
Urology	1	1	1	1	4%	-5%
Other Surgical Specialties	1	1	1	1	11%	2%
			Projected Regional Population Change 2005-2020:			*9%*

Figure 58 – Flint Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,425**	**276**	**1,463**	**288**	**3%**	**5%**
Primary Care	*748*	*145*	*769*	*152*	*3%*	*5%*
General/Family Medicine	376	73	375	74	0%	2%
General Internal Medicine	286	55	310	61	9%	11%
General Pediatrics	86	17	84	17	-3%	-1%
Non-Primary Care	*676*	*131*	*694*	*137*	*3%*	*5%*
Cardiovascular Diseases	27	5	24	5	-13%	-11%
Other Internal Medicine Subspecialties	121	23	133	26	9%	12%
Obstetrics and Gynecology	79	15	81	16	2%	4%
Pathology	25	5	22	4	-12%	-11%
Psychiatry	34	7	32	6	-6%	-4%
Anesthesiology	47	9	50	10	8%	10%
Radiology	79	15	82	16	3%	5%
Emergency Medicine	48	9	60	12	24%	26%
General Surgery	63	12	60	12	-5%	-3%
Ophthalmology	19	4	18	3	-6%	-4%
Otolaryngology	12	2	11	2	-7%	-5%
Orthopedic Surgery	34	6	32	6	-4%	-2%
Urology	10	2	10	2	-3%	-1%
Other Surgical Specialties	22	4	21	4	-4%	-2%
			Projected Regional Population Change 2005-2020:			*-2%*

Figure 59 – Grand Rapids-Muskegon Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**2,756**	**233**	**3,261**	**241**	**18%**	**3%**
Primary Care	*1,053*	*89*	*1,237*	*91*	*17%*	*3%*
General/Family Medicine	547	46	627	46	15%	0%
General Internal Medicine	333	28	417	31	25%	9%
General Pediatrics	173	15	192	14	11%	-3%
Non-Primary Care	*1,702*	*144*	*2,024*	*149*	*19%*	*4%*
Cardiovascular Diseases	45	4	45	3	0%	-13%
Other Internal Medicine Subspecialties	221	19	280	21	26%	10%
Obstetrics and Gynecology	180	15	215	16	19%	4%
Pathology	54	5	55	4	1%	-12%
Psychiatry	85	7	93	7	9%	-4%
Anesthesiology	157	13	194	14	23%	8%
Radiology	129	11	151	11	17%	3%
Emergency Medicine	195	16	278	21	43%	25%
General Surgery	165	14	181	13	10%	-4%
Ophthalmology	64	5	67	5	5%	-8%
Otolaryngology	30	3	34	3	13%	-1%
Orthopedic Surgery	116	10	127	9	10%	-4%
Urology	38	3	42	3	11%	-3%
Other Surgical Specialties	70	6	77	6	10%	-4%
			Projected Regional Population Change 2005-2020:			*14%*

Figure 60 – Jackson Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**605**	**130**	**662**	**138**	**9%**	**6%**
Primary Care	*253*	*54*	*274*	*57*	*8%*	*5%*
General/Family Medicine	135	29	143	30	6%	2%
General Internal Medicine	79	17	93	19	18%	14%
General Pediatrics	39	8	38	8	-2%	-5%
Non-Primary Care	*352*	*76*	*388*	*81*	*10%*	*6%*
Cardiovascular Diseases	17	4	17	3	-3%	-7%
Other Internal Medicine Subspecialties	54	12	66	14	22%	17%
Obstetrics and Gynecology	29	6	31	7	8%	4%
Pathology	12	3	12	2	-4%	-7%
Psychiatry	31	7	31	6	0%	-3%
Anesthesiology	30	6	34	7	16%	12%
Radiology	22	5	24	5	10%	6%
Emergency Medicine	31	7	40	8	30%	25%
General Surgery	32	7	32	7	2%	-1%
Ophthalmology	18	4	18	4	0%	-4%
Otolaryngology	10	2	10	2	2%	-2%
Orthopedic Surgery	17	4	18	4	3%	0%
Urology	7	2	8	2	4%	1%
Other Surgical Specialties	4	1	4	1	2%	-1%
			Projected Regional Population Change 2005-2020:			*4%*

Figure 61 – Kalamazoo-Battle Creek Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,521**	**275**	**1,636**	**285**	**8%**	**4%**
Primary Care	*576*	*104*	*618*	*108*	*7%*	*4%*
General/Family Medicine	254	46	265	46	4%	1%
General Internal Medicine	214	39	242	42	13%	9%
General Pediatrics	107	19	111	19	4%	0%
Non-Primary Care	*945*	*171*	*1,018*	*177*	*8%*	*4%*
Cardiovascular Diseases	38	7	34	6	-10%	-14%
Other Internal Medicine Subspecialties	146	26	168	29	15%	11%
Obstetrics and Gynecology	69	12	74	13	6%	3%
Pathology	27	5	25	4	-10%	-13%
Psychiatry	99	18	98	17	-1%	-5%
Anesthesiology	51	9	57	10	11%	7%
Radiology	53	9	56	10	7%	3%
Emergency Medicine	127	23	164	29	29%	24%
General Surgery	83	15	82	14	-1%	-5%
Ophthalmology	30	5	29	5	-4%	-7%
Otolaryngology	15	3	16	3	7%	3%
Orthopedic Surgery	60	11	60	10	0%	-3%
Urology	17	3	17	3	1%	-3%
Other Surgical Specialties	28	5	28	5	-1%	-5%
			Projected Regional Population Change 2005-2020:			*4%*

Figure 62 – Lansing Area Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,523**	**330**	**1,699**	**352**	**12%**	**7%**
Primary Care	*629*	*136*	*700*	*145*	*11%*	*6%*
General/Family Medicine	334	72	364	75	9%	4%
General Internal Medicine	181	39	218	45	21%	15%
General Pediatrics	114	25	118	24	4%	-1%
Non-Primary Care	*894*	*194*	*1,000*	*207*	*12%*	*7%*
Cardiovascular Diseases	43	9	43	9	1%	-4%
Other Internal Medicine Subspecialties	119	26	145	30	22%	16%
Obstetrics and Gynecology	86	19	90	19	5%	0%
Pathology	23	5	22	4	-5%	-9%
Psychiatry	95	21	94	20	-1%	-5%
Anesthesiology	61	13	72	15	19%	13%
Radiology	54	12	61	13	13%	8%
Emergency Medicine	98	21	127	26	29%	24%
General Surgery	68	15	72	15	6%	1%
Ophthalmology	27	6	29	6	5%	1%
Otolaryngology	11	2	11	2	1%	-4%
Orthopedic Surgery	35	7	36	8	5%	0%
Urology	15	3	16	3	10%	5%
Other Surgical Specialties	24	5	25	5	5%	1%
			Projected Regional Population Change 2005-2020:			*5%*

Figure 63 – Northeast Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**243**	**170**	**279**	**179**	**15%**	**5%**
Primary Care	*124*	*87*	*141*	*91*	*13%*	*4%*
General/Family Medicine	79	55	89	57	12%	3%
General Internal Medicine	34	24	42	27	22%	12%
General Pediatrics	11	8	11	7	-2%	-10%
Non-Primary Care	*119*	*83*	*138*	*88*	*16%*	*6%*
Cardiovascular Diseases	2	1	2	1	-2%	-10%
Other Internal Medicine Subspecialties	12	8	15	10	27%	17%
Obstetrics and Gynecology	11	8	12	8	15%	5%
Pathology	5	4	5	3	-6%	-13%
Psychiatry	4	3	5	3	8%	-1%
Anesthesiology	12	8	15	10	23%	13%
Radiology	9	6	10	6	16%	6%
Emergency Medicine	18	12	24	15	32%	21%
General Surgery	18	12	19	12	7%	-1%
Ophthalmology	2	1	2	1	4%	-4%
Otolaryngology	1	1	1	1	-7%	-14%
Orthopedic Surgery	13	9	14	9	8%	-1%
Urology	4	3	5	3	4%	-4%
Other Surgical Specialties	0	0	0	0	--	--
			Projected Regional Population Change 2005-2020:			*9%*

Figure 64 – Northwest Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**853**	**286**	**1,076**	**307**	**26%**	**8%**
Primary Care	*341*	*114*	*427*	*122*	*25%*	*7%*
General/Family Medicine	204	68	251	72	23%	5%
General Internal Medicine	103	35	141	40	37%	16%
General Pediatrics	33	11	35	10	4%	-12%
Non-Primary Care	*512*	*172*	*649*	*185*	*27%*	*8%*
Cardiovascular Diseases	23	8	25	7	9%	-7%
Other Internal Medicine Subspecialties	56	19	79	22	41%	20%
Obstetrics and Gynecology	41	14	50	14	20%	3%
Pathology	21	7	24	7	14%	-3%
Psychiatry	36	12	41	12	14%	-3%
Anesthesiology	49	17	65	19	33%	13%
Radiology	37	12	48	14	29%	10%
Emergency Medicine	50	17	74	21	47%	26%
General Surgery	47	16	56	16	20%	2%
Ophthalmology	25	8	29	8	15%	-2%
Otolaryngology	10	3	13	4	31%	12%
Orthopedic Surgery	33	11	41	12	23%	5%
Urology	11	4	13	4	16%	-1%
Other Surgical Specialties	19	6	23	7	20%	2%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 65 – Saginaw-Thumb Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,534**	**242**	**1,659**	**259**	**8%**	**7%**
Primary Care	*654*	*103*	*703*	*110*	*7%*	*6%*
General/Family Medicine	412	65	433	68	5%	4%
General Internal Medicine	183	29	214	33	17%	16%
General Pediatrics	60	9	56	9	-6%	-7%
Non-Primary Care	*880*	*139*	*957*	*150*	*9%*	*8%*
Cardiovascular Diseases	44	7	42	7	-5%	-6%
Other Internal Medicine Subspecialties	98	15	116	18	18%	17%
Obstetrics and Gynecology	78	12	81	13	4%	3%
Pathology	24	4	22	3	-8%	-9%
Psychiatry	48	8	46	7	-3%	-4%
Anesthesiology	70	11	80	13	14%	13%
Radiology	79	12	87	14	10%	9%
Emergency Medicine	107	17	134	21	26%	24%
General Surgery	82	13	83	13	2%	1%
Ophthalmology	36	6	37	6	1%	1%
Otolaryngology	20	3	20	3	0%	-1%
Orthopedic Surgery	49	8	51	8	3%	2%
Urology	23	4	24	4	4%	3%
Other Surgical Specialties	24	4	25	4	3%	2%
			Projected Regional Population Change 2005-2020:			*1%*

Figure 66 – Southwest Michigan Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**397**	**136**	**410**	**141**	**3%**	**4%**
Primary Care	*188*	*64*	*194*	*67*	*3%*	*4%*
General/Family Medicine	107	37	108	37	1%	1%
General Internal Medicine	56	19	62	21	10%	11%
General Pediatrics	25	8	24	8	-3%	-2%
Non-Primary Care	*209*	*72*	*216*	*74*	*3%*	*4%*
Cardiovascular Diseases	14	5	12	4	-15%	-14%
Other Internal Medicine Subspecialties	32	11	36	13	13%	14%
Obstetrics and Gynecology	25	9	26	9	2%	3%
Pathology	7	2	6	2	-12%	-11%
Psychiatry	8	3	7	3	-7%	-7%
Anesthesiology	20	7	22	7	10%	10%
Radiology	17	6	18	6	4%	5%
Emergency Medicine	16	5	19	7	24%	25%
General Surgery	25	9	24	8	-2%	-2%
Ophthalmology	8	3	7	3	-7%	-6%
Otolaryngology	5	2	5	2	-7%	-6%
Orthopedic Surgery	8	3	8	3	-2%	-1%
Urology	5	2	5	2	-4%	-4%
Other Surgical Specialties	6	2	6	2	-1%	-1%
			Projected Regional Population Change 2005-2020:			*-1%*

Figure 67 – Upper Peninsula Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**700**	**223**	**741**	**238**	**6%**	**7%**
Primary Care	*336*	*107*	*350*	*113*	*4%*	*5%*
General/Family Medicine	239	76	247	79	3%	4%
General Internal Medicine	65	21	75	24	15%	16%
General Pediatrics	31	10	29	9	-9%	-8%
Non-Primary Care	*364*	*116*	*391*	*126*	*7%*	*8%*
Cardiovascular Diseases	12	4	11	4	-5%	-4%
Other Internal Medicine Subspecialties	53	17	62	20	18%	19%
Obstetrics and Gynecology	34	11	34	11	0%	1%
Pathology	16	5	15	5	-8%	-7%
Psychiatry	26	8	24	8	-5%	-4%
Anesthesiology	22	7	25	8	14%	15%
Radiology	30	9	32	10	8%	9%
Emergency Medicine	31	10	39	13	27%	28%
General Surgery	39	12	40	13	2%	3%
Ophthalmology	16	5	16	5	-4%	-3%
Otolaryngology	9	3	10	3	7%	8%
Orthopedic Surgery	17	5	17	6	1%	2%
Urology	7	2	8	3	11%	12%
Other Surgical Specialties	8	3	8	3	3%	4%
			Projected Regional Population Change 2005-2020:			*-1%*

Figure 68 – West Central Regional Physician Supply Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**481**	**123**	**544**	**128**	**13%**	**4%**
Primary Care	*247*	*63*	*278*	*66*	*13%*	*4%*
General/Family Medicine	168	43	186	44	10%	2%
General Internal Medicine	60	15	73	17	22%	12%
General Pediatrics	19	5	20	5	4%	-5%
Non-Primary Care	*234*	*60*	*266*	*63*	*14%*	*5%*
Cardiovascular Diseases	11	3	11	3	0%	-8%
Other Internal Medicine Subspecialties	26	7	32	7	24%	14%
Obstetrics and Gynecology	30	8	34	8	12%	3%
Pathology	8	2	8	2	-2%	-10%
Psychiatry	11	3	12	3	7%	-2%
Anesthesiology	13	3	15	4	21%	11%
Radiology	20	5	23	5	15%	6%
Emergency Medicine	25	6	34	8	35%	25%
General Surgery	33	8	35	8	6%	-2%
Ophthalmology	6	2	6	1	1%	-7%
Otolaryngology	3	1	3	1	7%	-2%
Orthopedic Surgery	16	4	17	4	5%	-4%
Urology	5	1	5	1	3%	-5%
Other Surgical Specialties	1	0	1	0	3%	-5%
			Projected Regional Population Change 2005-2020:			*9%*

Chapter 8: Michigan Physician Demand Forecasting

State Level Physician Demand Forecasts

Forecasts of the demand for physicians in Michigan were based upon the methodology employed in the Physician Demand Model (PDM) developed and maintained by the Bureau of Health Professions in the Health Resources and Services Administration of the Department of Health and Human Services and used to generate national forecasts for COGME *Sixteenth Report*. The PDM forecasts the future demand for physicians according to the following steps:

- Populations are projected by age, sex, urban or rural location, and source of health insurance.
- Physician staffing models that specify per capita physician demand by specialty, age, sex, location, and insurance are applied to the various age, sex, location, and insurance combinations to produce total requirements.

For this project, statewide demand forecasts as well as regional demand forecasts for 2005 through 2020. For both the statewide and regional forecasts, Michigan-specific population data estimates and forecasts were used. For the statewide forecasts, data were obtained directly from the Census Bureau (U.S. Census Bureau, 2005). For the regional forecasts, data were obtained separately by age, by sex, and by urban/rural location. Statistical methods were applied to these marginal totals to form population estimates by region broken out by the cross product of age, sex, and location. Insurance coverage was not projected to change over the period of the baseline forecast.

PDM staffing models were updated at the national level in 2003 to incorporate the most recent age, sex, insurance, and location-specific per capita physician demand by specialty. The PDM contains an automated tool to adjust the national staffing ratios to match a particular state or sub-state location at a point in time. This procedure was followed to generate staffing ratios appropriate to Michigan, and each of its regions, in 2005.[8]

Two future demand environments were constructed to show the breadth of potential futures for physician demand in Michigan

Insurance Environments

In the current health care delivery system, lack of health insurance reduces the demand for physician services. Thus, extending insurance coverage would lead to higher demand for physician services. The most recent data available for Michigan indicated that 11.4 percent of the population was without health insurance (DeNavas-Walt et al., 2005). Making use of the PDM parameters which specify the sensitivity of demand to insurance, two insurance environments were modeled.

[8] These adjusted staffing models preserve the differences in per capita demand for the various age, sex, location, and insurance categories found nationally. They were scaled up or down so that total demand in the state or region matched actual demand at the given point in time.

Constant Insurance Environment. The first insurance environment assumed that the current insurance environment remains intact over the forecast period. In the Constant Insurance Environment forecasts, demand in 2005 was benchmarked to supply in 2005.

Full Insurance Environment. The second insurance environment assumed that the health care system changes in such a way that the entire population has insurance. In this environment, the entire change was modeled to occur in the first year of the forecast period (2005). Thus, in the Full Insurance Environment forecasts, demand in 2005 was greater than the supply of physicians in 2005.

Demand Forecast Scenarios

For each of the constructed insurance environments, a number of scenarios were developed to present the future physician requirements under a number of sets of assumptions. The demand scenarios were as follows:

State Level Demand Scenario 1: Demographic Only (Baseline) Scenario. The baseline scenario incorporated the effect of population growth and aging on the demand for physician services. Demand forecasts were produced for additional scenarios as described below.

State Level Demand Scenario 2: Trend Scenario. The Trend Scenario added the effect of economic growth to the demographic only baseline. Over time, the demand for physician services has increased dramatically over and above what would be suggested by population growth and aging. This has generally been attributed to the effect of economic growth – as people have more disposable resources they consume more of most things including physician services (see discussion of the Cooper's Trend Model on p. 33). Following the algorithm used in COGME's *Sixteenth Report*, this scenario assumed a 0.75 percent increase per year in the demand for physician services due to economic growth. The demand for specialty care has been shown to be much more sensitive to income than the demand for primary care. In the trend scenario, the economic effect on demand for specialists was set at twice the effect on primary care, with the combined increase limited to 0.75 percent per year.

State Level Demand Scenarios 3 and 4: Reduction of Unnecessary Services Scenarios. In this scenario, it is assumed that unnecessary services are steadily reduced between 2010 and 2020 such that all are eliminated by 2020. It is implemented by decreasing demand by 13.75 percent in 2015 and by 27.50 percent in 2020. The decrease in demand was applied separately to both the baseline demographic only scenario and the trend scenario forecasts.

Michigan Physician Demand Forecasts, 2005 – 2020

Constant Insurance Environment

State Level Demand Scenario 1: Demographic Only Scenario
In this scenario, demand for physicians was forecast to increase by 12 percent between 2005 and 2020, with the demand for physicians predicted to increase from 30,366 physicians in 2005 to 33,888 in 2020. Adjusting for the projected population growth in the state, the demand for

physicians expressed in terms of a physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 317 physicians per 100,000 population.

Figure 69 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,488	10,428,683	302
2015	32,686	10,599,122	308
2020	33,888	10,695,993	317
Percent Change 2005-2020	12%	5%	6%

In this scenario, demand for primary care physicians was forecast to increase by 10 percent between 2005 and 2020, with the demand for primary care physicians predicted to increase from 11,744 physicians in 2005 to 12,954 in 2020. Adjusting for the projected population growth in the state, the demand for primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 115 physicians per 100,000 population to 121 physicians per 100,000 population.

In this scenario, demand for non-primary care physicians was forecast to increase by 12 percent between 2005 and 2020, with the demand for non-primary care physicians predicted to increase from 18,622 physicians in 2005 to 20,934 in 2020. Adjusting for the projected population growth in the state, the demand for non-primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 196 physicians per 100,000 population.

Figure 70 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,107	10,428,683	116
2015	12,524	10,599,122	118
2020	12,954	10,695,993	121
Percent Change 2005-2020	10%	5%	5%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,381	10,428,683	186
2015	20,161	10,599,122	190
2020	20,934	10,695,993	196
Percent Change 2005-2020	12%	5%	7%

Specialty-Specific Demand Forecasts

In this scenario, the demand for physicians was forecast to increase for all specialties with the exception of General Pediatrics. The forecast demand growth showed much variation with demand for General/Family Physicians, Obstetrician/Gynecologists, Psychiatrists, Emergency Medicine physicians, and Otolaryngologists growing at rates lower than the demand for physicians in general; and demand for General Internists, Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Urologists, and other Surgical Specialists growing at rates higher than the demand for physicians in general. In this scenario, one specialty, Obstetrics and Gynecology, was forecast to grow at a slower pace than the population. In all other

specialties where demand was forecast to grow, the rate of growth was greater than the rate of growth in the population.

Primary Care Specialties

General/Family Medicine

The Demographic Only Scenario forecast an 11 percent increase in the demand for General/Family Physicians between 2005 and 2020, slightly above the level of growth in demand predicted for primary care physicians, with the demand for General/Family Physicians predicted to increase from 5,080 physicians in 2005 to 5,631 in 2020. Adjusting for the projected population growth in the state, the demand for General/Family Physicians expressed in terms of a physician to population ratio was predicted to grow from 49.8 physicians per 100,000 population to 52.6 physicians per 100,000 population.

General Internal Medicine

The Demographic Only Scenario forecast a 15 percent increase in the demand for General Internists between 2005 and 2020, somewhat above the level of growth in demand predicted for primary care physicians, with the demand for General Internists predicted to increase from 4,742 physicians in 2005 to 5,458 in 2020. Adjusting for the projected population growth in the state, the demand for General Internists expressed in terms of a physician to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 51.0 physicians per 100,000 population.

General Pediatrics

The Demographic Only Scenario forecast a 3 percent decrease in the demand for General Pediatricians between 2005 and 2020, unlike the growth in demand predicted for primary care physicians, with the demand for General Pediatricians predicted to decrease from 1,922 physicians in 2005 to 1,865 in 2020. Adjusting for the projected population growth in the state, the demand for General Pediatricians expressed in terms of a physician to population ratio was predicted to decrease from 18.8 physicians per 100,000 population to 17.4 physicians per 100,000 population.

Figure 71 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,107	10,428,683	116
2015	12,524	10,599,122	118
2020	12,954	10,695,993	121
Percent Change 2005-2020	10%	5%	5%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,267	10,428,683	50.5
2015	5,453	10,599,122	51.4
2020	5,631	10,695,993	52.6
Percent Change 2005-2020	11%	5%	6%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	4,970	10,428,683	47.7
2015	5,207	10,599,122	49.1
2020	5,458	10,695,993	51.0
Percent Change 2005-2020	15%	5%	10%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,870	10,428,683	17.9
2015	1,864	10,599,122	17.6
2020	1,865	10,695,993	17.4
Percent Change 2005-2020	-3%	5%	-7%

Non-Primary Care Specialties

Cardiovascular Disease

The Demographic Only Scenario forecast a 22 percent increase in the demand for Cardiologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Cardiologists predicted to increase from 736 physicians in 2005 to 896 in 2020. Adjusting for the projected population growth in the state, the demand for Cardiologists expressed in terms of a physician to population ratio was predicted to increase from 7.2 physicians per 100,000 population to 8.4 physicians per 100,000 population.

Other Internal Medicine Subspecialties

The Demographic Only Scenario forecast a 17 percent increase in the demand for other Internal Medicine Subspecialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Internal Medicine Subspecialists predicted to increase from 2,970 physicians in 2005 to 3,470 in 2020. Adjusting for the projected population growth in the state, the demand for other Internal Medicine Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 32.4 physicians per 100,000 population.

Obstetrics and Gynecology

The Demographic Only Scenario forecast a 1 percent increase in the demand for Obstetrician/Gynecologists between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Obstetrician/Gynecologists predicted to slightly increase from 1,712 physicians in 2005 to 1,725 in 2020. Adjusting for the projected population growth in the state, the demand for Obstetrician/Gynecologists expressed in terms of a physician to population ratio was predicted to decrease from 16.8 physicians per 100,000 population to 16.1 physicians per 100,000 population.

Pathology

The Demographic Only Scenario forecast a 13 percent increase in the demand for Pathologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Pathologists predicted to increase from 717 physicians in 2005 to 809 in 2020. Adjusting for the projected population growth in the state, the demand for Pathologists expressed in terms of a physician to population ratio was predicted to increase slightly from 7.0 physicians per 100,000 population to 7.6 physicians per 100,000 population.

Figure 72 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	780	10,428,683	7.5
2015	835	10,599,122	7.9
2020	896	10,695,993	8.4
Percent Change 2005-2020	22%	5%	16%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,128	10,428,683	30.0
2015	3,298	10,599,122	31.1
2020	3,470	10,695,993	32.4
Percent Change 2005-2020	17%	5%	12%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,740	10,428,683	16.7
2015	1,742	10,599,122	16.4
2020	1,725	10,695,993	16.1
Percent Change 2005-2020	1%	5%	-4%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	750	10,428,683	7.2
2015	781	10,599,122	7.4
2020	809	10,695,993	7.6
Percent Change 2005-2020	13%	5%	8%

Psychiatry

The Demographic Only Scenario forecast a 7 percent increase in the demand for Psychiatrists between 2005 and 2020, somewhat below the rate of growth in demand predicted for non-primary care physicians, with the demand for Psychiatrists predicted to increase from 1,357 physicians in 2005 to 1,457 in 2020. Adjusting for the projected population growth in the state, the demand for Psychiatrists expressed in terms of a physician to population ratio was predicted to increase slightly from 13.3 physicians per 100,000 population to 13.6 physicians per 100,000 population.

Anesthesiology

The Demographic Only Scenario forecast a 15 percent increase in the demand for Anesthesiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Anesthesiologists predicted to increase from 1,292 physicians in 2005 to 1,483 in 2020. Adjusting for the projected population growth in the state, the demand for Anesthesiologists expressed in terms of a physician to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 13.9 physicians per 100,000 population.

Radiology

The Demographic Only Scenario forecast a 14 percent increase in the demand for Radiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Radiologists predicted to increase from 1,375 physicians in 2005 to 1,573 in 2020. Adjusting for the projected population growth in the state, the demand for Radiologists expressed in terms of a physician to population ratio was predicted to increase from 13.5 physicians per 100,000 population to 14.7 physicians per 100,000 population.

Emergency Medicine

The Demographic Only Scenario forecast a 5 percent increase in the demand for Emergency Medicine physicians between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Emergency Medicine physicians predicted to increase from 1,655 physicians in 2005 to 1,743 in 2020. Adjusting for the projected population growth in the state, the demand for Emergency Medicine physicians expressed in terms of a physician to population ratio was predicted to increase slightly from 16.2 physicians per 100,000 population to 16.3 physicians per 100,000 population.

Figure 73 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,403	10,428,683	13.4
2015	1,434	10,599,122	13.5
2020	1,457	10,695,993	13.6
Percent Change 2005-2020	7%	5%	2%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,346	10,428,683	12.9
2015	1,411	10,599,122	13.3
2020	1,483	10,695,993	13.9
Percent Change 2005-2020	15%	5%	10%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,431	10,428,683	13.7
2015	1,497	10,599,122	14.1
2020	1,573	10,695,993	14.7
Percent Change 2005-2020	14%	5%	9%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,691	10,428,683	16.2
2015	1,720	10,599,122	16.2
2020	1,743	10,695,993	16.3
Percent Change 2005-2020	5%	5%	1%

General Surgery

The Demographic Only Scenario forecast a 15 percent increase in the demand for General Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for General Surgeons predicted to increase from 1,648 physicians in 2005 to 1,894 in 2020. Adjusting for the projected population growth in the state, the demand for General Surgeons expressed in terms of a physician to population ratio was predicted to increase from 16.1 physicians per 100,000 population to 17.7 physicians per 100,000 population.

Ophthalmology

The Demographic Only Scenario forecast an 18 percent increase in the demand for Ophthalmologists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for Ophthalmologists predicted to increase from 668 physicians in 2005 to 786 in 2020. Adjusting for the projected population growth in the state, the demand for Ophthalmologists expressed in terms of a physician to population ratio was predicted to increase from 6.5 physicians per 100,000 population to 7.3 physicians per 100,000 population.

Otolaryngology

The Demographic Only Scenario forecast a 9 percent increase in the demand for Otolaryngologists between 2005 and 2020, slightly below the rate of growth in demand predicted for non-primary care physicians, with the demand for Otolaryngologists predicted to increase from 317 physicians in 2005 to 347 in 2020. Adjusting for the projected population growth in the state, the demand for Otolaryngologists expressed in terms of a physician to population ratio was predicted to increase slightly from 3.1 physicians per 100,000 population to 3.2 physicians per 100,000 population.

Orthopedic Surgery

The Demographic Only Scenario forecast a 14 percent increase in the demand for Orthopedic Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Orthopedic Surgeons predicted to increase from 844 physicians in 2005 to 958 in 2020. Adjusting for the projected population growth in the state, the demand for Orthopedic Surgeons expressed in terms of a physician to population ratio was predicted to increase from 8.3 physicians per 100,000 population to 9.0 physicians per 100,000 population.

Figure 74 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,726	10,428,683	16.6
2015	1,811	10,599,122	17.1
2020	1,894	10,695,993	17.7
Percent Change 2005-2020	15%	5%	10%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	701	10,428,683	6.7
2015	741	10,599,122	7.0
2020	786	10,695,993	7.3
Percent Change 2005-2020	18%	5%	12%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	327	10,428,683	3.1
2015	337	10,599,122	3.2
2020	347	10,695,993	3.2
Percent Change 2005-2020	9%	5%	4%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	878	10,428,683	8.4
2015	917	10,599,122	8.7
2020	958	10,695,993	9.0
Percent Change 2005-2020	14%	5%	8%

Urology

The Demographic Only Scenario forecast a 19 percent increase in the demand for Urologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Urologists predicted to increase from 375 physicians in 2005 to 445 in 2020. Adjusting for the projected population growth in the state, the demand for Urologists expressed in terms of a physician to population ratio was predicted to increase from 3.7 physicians per 100,000 population to 4.2 physicians per 100,000 population.

Other Surgical Subspecialists

The Demographic Only Scenario forecast a 17 percent increase in the demand for other Surgical Subspecialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Surgical Subspecialists predicted to increase from 568 physicians in 2005 to 662 in 2020. Adjusting for the projected population growth in the state, the demand for other Surgical Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 5.6 physicians per 100,000 population to 6.2 physicians per 100,000 population.

Figure 75 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	394	10,428,683	3.8
2015	419	10,599,122	4.0
2020	445	10,695,993	4.2
Percent Change 2005-2020	19%	5%	13%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	598	10,428,683	5.7
2015	631	10,599,122	6.0
2020	662	10,695,993	6.2
Percent Change 2005-2020	17%	5%	11%

State Level Demand Scenario 2: Trend Scenario

In this scenario, demand for physicians was forecast to increase by 25 percent between 2005 and 2020, with the demand for physicians predicted to increase from 30,366 physicians in 2005 to 37,907 in 2020. Adjusting for the projected population growth in the state, the demand for physicians expressed in terms of a physician to population ratio was predicted to grow from 297 physicians per 100,000 population to 354 physicians per 100,000 population.

Figure 76 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	32,687	10,428,683	313
2015	35,222	10,599,122	332
2020	37,907	10,695,993	354
Percent Change 2005-2020	25%	5%	19%

In this scenario, demand for primary care physicians was forecast to increase by 18 percent between 2005 and 2020, with the demand for primary care physicians predicted to increase from 11,744 physicians in 2005 to 13,830 in 2020. Adjusting for the projected population growth in the state, the demand for primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 115 physicians per 100,000 population to 129 physicians per 100,000 population.

In this scenario, demand for non-primary care physicians was forecast to increase by 29 percent between 2005 and 2020, with the demand for non-primary care physicians predicted to increase from 18,622 physicians in 2005 to 24,077 in 2020. Adjusting for the projected population growth in the state, the demand for non-primary care physicians expressed in terms of a physician to population ratio was predicted to grow from 182 physicians per 100,000 population to 225 physicians per 100,000 population.

Figure 77 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,377	10,428,683	119
2015	13,085	10,599,122	123
2020	13,830	10,695,993	129
Percent Change 2005-2020	18%	5%	12%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	20,310	10,428,683	195
2015	22,136	10,599,122	209
2020	24,077	10,695,993	225
Percent Change 2005-2020	29%	5%	23%

Specialty-Specific Demand Forecasts

In the Trend Only Scenario, the demand for physicians was forecast to increase for all specialties. The forecast demand growth showed much variation with demand for General/Family Physicians, General Internists, General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, and Emergency Medicine physicians growing at rates lower than the demand for physicians in general; and demand for Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Otolaryngologists, Urologists, and other Surgical Specialists growing at rates higher than the demand for physicians in general. In this scenario, one specialty, Pediatrics, was forecast to grow at a slower pace than the population. In all other specialties where demand was forecast to grow, the rate of growth was greater than the rate of growth in the population.

Primary Care Specialties

General/Family Medicine

The Trend Scenario forecast an 18 percent increase in the demand for General/Family Physicians between 2005 and 2020, about the same rate of growth in demand predicted for primary care physicians, with the demand for General/Family Physicians predicted to increase from 5,080 physicians in 2005 to 6,012 in 2020. Adjusting for the projected population growth in the state, the demand for General/Family Physicians expressed in terms of a physician to population ratio

was predicted to grow from 49.8 physicians per 100,000 population to 56.2 physicians per 100,000 population.

General Internal Medicine

The Trend Scenario forecast a 23 percent increase in the demand for General Internists between 2005 and 2020, somewhat above the rate of growth in demand predicted for primary care physicians, with the demand for General Internists predicted to increase from 4,742 physicians in 2005 to 5,827 in 2020. Adjusting for the projected population growth in the state, the demand for General Internists expressed in terms of a physician to population ratio was predicted to grow from 46.5 physicians per 100,000 population to 54.5 physicians per 100,000 population.

General Pediatrics

The Trend Scenario forecast a 4 percent increase in the demand for General Pediatricians between 2005 and 2020, far below the rate of growth in demand predicted for primary care physicians, with the demand for General Pediatricians predicted to only increase from 1,922 physicians in 2005 to 1,991 in 2020. Adjusting for the projected population growth in the state, the demand for General Pediatricians expressed in terms of a physician to population ratio was predicted to decrease from 18.8 physicians per 100,000 population to 18.6 physicians per 100,000 population.

Figure 78 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,377	10,428,683	119
2015	13,085	10,599,122	123
2020	13,830	10,695,993	129
Percent Change 2005-2020	18%	5%	12%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,384	10,428,683	51.6
2015	5,697	10,599,122	53.7
2020	6,012	10,695,993	56.2
Percent Change 2005-2020	18%	5%	13%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,081	10,428,683	48.7
2015	5,440	10,599,122	51.3
2020	5,827	10,695,993	54.5
Percent Change 2005-2020	23%	5%	17%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,912	10,428,683	18.3
2015	1,948	10,599,122	18.4
2020	1,991	10,695,993	18.6
Percent Change 2005-2020	4%	5%	-1%

Non-Primary Care Specialties

Cardiovascular Disease

The Trend Scenario forecast a 40 percent increase in the demand for Cardiologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Cardiologists predicted to increase from 736 physicians in 2005 to 1,031 in 2020. Adjusting for the projected population growth in the state, the demand for Cardiologists

expressed in terms of a physician to population ratio was predicted to increase from 7.2 physicians per 100,000 population to 9.6 physicians per 100,000 population.

Other Internal Medicine Subspecialties

The Trend Scenario forecast a 34 percent increase in the demand for other Internal Medicine Subspecialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Internal Medicine Subspecialists predicted to increase from 2,970 physicians in 2005 to 3,991 in 2020. Adjusting for the projected population growth in the state, the demand for other Internal Medicine Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 29.1 physicians per 100,000 population to 37.3 physicians per 100,000 population.

Obstetrics and Gynecology

The Trend Scenario forecast a 16 percent increase in the demand for Obstetrician/Gynecologists between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Obstetrician/Gynecologists predicted to increase from 1,712 physicians in 2005 to 1,984 in 2020. Adjusting for the projected population growth in the state, the demand for Obstetrician/Gynecologists expressed in terms of a physician to population ratio was predicted to increase from 16.8 physicians per 100,000 population to 18.6 physicians per 100,000 population.

Pathology

The Trend Scenario forecast a 30 percent increase in the demand for Pathologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Pathologists predicted to increase from 717 physicians in 2005 to 931 in 2020. Adjusting for the projected population growth in the state, the demand for Pathologists expressed in terms of a physician to population ratio was predicted to increase from 7.0 physicians per 100,000 population to 8.7 physicians per 100,000 population.

Figure 79 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	817	10,428,683	7.8
2015	917	10,599,122	8.6
2020	1,031	10,695,993	9.6
Percent Change 2005-2020	40%	5%	34%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,277	10,428,683	31.4
2015	3,308	10,599,122	31.2
2020	3,991	10,695,993	37.3
Percent Change 2005-2020	34%	5%	28%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,824	10,428,683	17.5
2015	1,912	10,599,122	18.0
2020	1,984	10,695,993	18.6
Percent Change 2005-2020	16%	5%	11%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	786	10,428,683	7.5
2015	857	10,599,122	8.1
2020	931	10,695,993	8.7
Percent Change 2005-2020	30%	5%	24%

Psychiatry

The Trend Scenario forecast a 23 percent increase in the demand for Psychiatrists between 2005 and 2020, somewhat below the rate of growth in demand predicted for non-primary care physicians, with the demand for Psychiatrists predicted to increase from 1,357 physicians in 2005 to 1,675 in 2020. Adjusting for the projected population growth in the state, the demand for Psychiatrists expressed in terms of a physician to population ratio was predicted to increase from 13.3 physicians per 100,000 population to 15.7 physicians per 100,000 population.

Anesthesiology

The Trend Scenario forecast a 32 percent increase in the demand for Anesthesiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Anesthesiologists predicted to increase from 1,292 physicians in 2005 to 1,706 in 2020. Adjusting for the projected population growth in the state, the demand for Anesthesiologists expressed in terms of a physician to population ratio was predicted to increase from 12.7 physicians per 100,000 population to 15.9 physicians per 100,000 population.

Radiology

The Trend Scenario forecast a 32 percent increase in the demand for Radiologists between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Radiologists predicted to increase from 1,375 physicians in 2005 to 1,809 in 2020. Adjusting for the projected population growth in the state, the demand for Radiologists expressed in terms of a physician to population ratio was predicted to increase from 13.5 physicians per 100,000 population to 16.9 physicians per 100,000 population.

Emergency Medicine

The Trend Scenario forecast a 21 percent increase in the demand for Emergency Medicine physicians between 2005 and 2020, well below the rate of growth in demand predicted for non-primary care physicians, with the demand for Emergency Medicine physicians predicted to increase from 1,655 physicians in 2005 to 2,005 in 2020. Adjusting for the projected population growth in the state, the demand for Emergency Medicine physicians expressed in terms of a physician to population ratio was predicted to increase from 16.2 physicians per 100,000 population to 18.7 physicians per 100,000 population.

Figure 80 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,470	10,428,683	14.1
2015	1,575	10,599,122	14.9
2020	1,675	10,695,993	15.7
Percent Change 2005-2020	23%	5%	18%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,410	10,428,683	13.5
2015	1,549	10,599,122	14.6
2020	1,706	10,695,993	15.9
Percent Change 2005-2020	32%	5%	26%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,500	10,428,683	14.4
2015	1,644	10,599,122	15.5
2020	1,809	10,695,993	16.9
Percent Change 2005-2020	32%	5%	26%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,772	10,428,683	17.0
2015	1,889	10,599,122	17.8
2020	2,005	10,695,993	18.7
Percent Change 2005-2020	21%	5%	16%

General Surgery

The Trend Scenario forecast a 32 percent increase in the demand for General Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for General Surgeons predicted to increase from 1,648 physicians in 2005 to 2,179 in 2020. Adjusting for the projected population growth in the state, the demand for General Surgeons expressed in terms of a physician to population ratio was predicted to increase from 16.1 physicians per 100,000 population to 20.4 physicians per 100,000 population.

Ophthalmology

The Trend Scenario forecast a 35 percent increase in the demand for Ophthalmologists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for Ophthalmologists predicted to increase from 668 physicians in 2005 to 904 in 2020. Adjusting for the projected population growth in the state, the demand for Ophthalmologists expressed in terms of a physician to population ratio was predicted to increase from 6.5 physicians per 100,000 population to 8.5 physicians per 100,000 population.

Otolaryngology

The Trend Scenario forecast a 26 percent increase in the demand for Otolaryngologists between 2005 and 2020, slightly below the rate of growth in demand predicted for non-primary care physicians, with the demand for Otolaryngologists predicted to increase from 317 physicians in 2005 to 399 in 2020. Adjusting for the projected population growth in the state, the demand for Otolaryngologists expressed in terms of a physician to population ratio was predicted to increase from 3.1 physicians per 100,000 population to 3.7 physicians per 100,000 population.

Orthopedic Surgery

The Trend Scenario forecast a 31 percent increase in the demand for Orthopedic Surgeons between 2005 and 2020, slightly above the rate of growth in demand predicted for non-primary care physicians, with the demand for Orthopedic Surgeons predicted to increase from 844 physicians in 2005 to 1,102 in 2020. Adjusting for the projected population growth in the state, the demand for Orthopedic Surgeons expressed in terms of a physician to population ratio was predicted to increase from 8.3 physicians per 100,000 population to 10.3 physicians per 100,000 population.

Figure 81 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,809	10,428,683	17.3
2015	1,989	10,599,122	18.8
2020	2,179	10,695,993	20.4
Percent Change 2005-2020	32%	5%	26%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	734	10,428,683	7.0
2015	814	10,599,122	7.7
2020	904	10,695,993	8.5
Percent Change 2005-2020	35%	5%	29%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	343	10,428,683	3.3
2015	370	10,599,122	3.5
2020	399	10,695,993	3.7
Percent Change 2005-2020	26%	5%	20%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	921	10,428,683	8.8
2015	1,007	10,599,122	9.5
2020	1,102	10,695,993	10.3
Percent Change 2005-2020	31%	5%	25%

Urology

The Trend Scenario forecast a 37 percent increase in the demand for Urologists between 2005 and 2020, well above the rate of growth in demand predicted for non-primary care physicians, with the demand for Urologists predicted to increase from 375 physicians in 2005 to 512 in 2020. Adjusting for the projected population growth in the state, the demand for Urologists expressed in terms of a physician to population ratio was predicted to increase from 3.7 physicians per 100,000 population to 4.8 physicians per 100,000 population.

Other Surgical Specialties

The Trend Scenario forecast a 34 percent increase in the demand for other Surgical Specialists between 2005 and 2020, somewhat above the rate of growth in demand predicted for non-primary care physicians, with the demand for other Surgical Subspecialists predicted to increase from 568 physicians in 2005 to 762 in 2020. Adjusting for the projected population growth in the state, the demand for other Surgical Subspecialists expressed in terms of a physician to population ratio was predicted to increase from 5.6 physicians per 100,000 population to 7.1 physicians per 100,000 population.

Figure 82 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	413	10,428,683	4.0
2015	460	10,599,122	4.3
2020	512	10,695,993	4.8
Percent Change 2005-2020	37%	5%	30%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	627	10,428,683	6.0
2015	693	10,599,122	6.5
2020	762	10,695,993	7.1
Percent Change 2005-2020	34%	5%	28%

State Level Demand Scenario 3: Demographic and Reduction of Unnecessary Services Scenario

In this scenario, demand for physicians was forecast to decrease by 19 percent between 2005 and 2020, with the demand for physicians predicted to decrease from 30,366 physicians in 2005 to 24,569 in 2020. Adjusting for the projected population growth in the state, the demand for physicians expressed in terms of a physician to population ratio was predicted to decrease from 297 physicians per 100,000 population to 230 physicians per 100,000 population.

Figure 83 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	31,488	10,428,683	302
2015	28,191	10,599,122	266
2020	24,569	10,695,993	230
Percent Change 2005-2020	-19%	5%	-23%

In this scenario, demand for primary care physicians was forecast to decrease by 20 percent between 2005 and 2020, with the demand for primary care physicians predicted to increase from 11,744 physicians in 2005 to 9,392 in 2020. Adjusting for the projected population growth in the state, the demand for primary care physicians expressed in terms of a physician to population ratio was predicted to decrease from 115 physicians per 100,000 population to 88 physicians per 100,000 population.

In this scenario, demand for non-primary care physicians was forecast to decrease by 18 percent between 2005 and 2020, with the demand for non-primary care physicians predicted to increase from 18,622 physicians in 2005 to 15,177 in 2020. Adjusting for the projected population growth

in the state, the demand for non-primary care physicians expressed in terms of a physician to population ratio was predicted to decrease from 182 physicians per 100,000 population to 142 physicians per 100,000 population.

Figure 84 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,107	10,428,683	116
2015	10,802	10,599,122	102
2020	9,392	10,695,993	88
Percent Change 2005-2020	-20%	5%	-24%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	19,381	10,428,683	186
2015	17,389	10,599,122	164
2020	15,177	10,695,993	142
Percent Change 2005-2020	-18%	5%	-22%

Specialty-Specific Demand Forecasts

In this scenario, the demand for physicians was forecast to decrease for all specialties. The forecast demand decline showed much variation with demand for General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, and Emergency Medicine physicians declining at rates quicker than the demand for physicians in general; and demand for General Internists, Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Urologists, and other Surgical Specialists declining at rates slower than the demand for physicians in general.

Primary Care Specialties

General/Family Medicine

This scenario forecast a 20 percent decrease in the demand for General/Family Physicians between 2005 and 2020, about the same rate of decline in demand predicted for primary care physicians, with the demand for General/Family Physicians predicted to decrease from 5,080 physicians in 2005 to 4,082 in 2020. Adjusting for the projected population growth in the state, the demand for General/Family Physicians expressed in terms of a physician to population ratio was predicted to decrease from 49.8 physicians per 100,000 population to 38.2 physicians per 100,000 population.

General Internal Medicine

This scenario forecast a 17 percent decrease in the demand for General Internists between 2005 and 2020, somewhat below the rate of decline in demand predicted for primary care physicians, with the demand for General Internists predicted to decrease from 4,742 physicians in 2005 to 3,957 in 2020. Adjusting for the projected population growth in the state, the demand for General Internists expressed in terms of a physician to population ratio was predicted to decrease from 46.5 physicians per 100,000 population to 37.0 physicians per 100,000 population.

General Pediatrics

This scenario forecast a 30 percent decrease in the demand for General Pediatricians between 2005 and 2020, well above the rate of decline in demand predicted for primary care physicians, with the demand for General Pediatricians predicted to decrease from 1,922 physicians in 2005 to 1,352 in 2020. Adjusting for the projected population growth in the state, the demand for General Pediatricians expressed in terms of a physician to population ratio was predicted to decrease from 18.8 physicians per 100,000 population to 12.6 physicians per 100,000 population.

Figure 85 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,107	10,428,683	116
2015	10,802	10,599,122	102
2020	9,392	10,695,993	88
Percent Change 2005-2020	-20%	5%	-24%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,267	10,428,683	50.5
2015	4,703	10,599,122	44.4
2020	4,082	10,695,993	38.2
Percent Change 2005-2020	-20%	5%	-23%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	4,970	10,428,683	47.7
2015	4,491	10,599,122	42.4
2020	3,957	10,695,993	37.0
Percent Change 2005-2020	-17%	5%	-20%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,870	10,428,683	17.9
2015	1,608	10,599,122	15.2
2020	1,352	10,695,993	12.6
Percent Change 2005-2020	-30%	5%	-33%

Non-Primary Care Specialties

Cardiovascular Disease

This scenario forecast a 12 percent decrease in the demand for Cardiologists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for Cardiologists predicted to decrease from 736 physicians in 2005 to 650 in 2020. Adjusting for the projected population growth in the state, the demand for Cardiologists expressed in terms of a physician to population ratio was predicted to decrease from 7.2 physicians per 100,000 population to 6.1 physicians per 100,000 population.

Other Internal Medicine Subspecialties

This scenario forecast a 15 percent decrease in the demand for other Internal Medicine Subspecialists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for other Internal Medicine Subspecialists predicted to decrease from 2,970 physicians in 2005 to 2,516 in 2020. Adjusting for the projected population growth in the state, the demand for other Internal Medicine Subspecialists expressed in terms of a physician to population ratio was predicted to decrease from 29.1 physicians per 100,000 population to 23.5 physicians per 100,000 population.

Obstetrics and Gynecology

This scenario forecast a 27 percent decrease in the demand for Obstetrician/Gynecologists between 2005 and 2020, somewhat above the rate of decline in demand predicted for non-primary care physicians, with the demand for Obstetrician/Gynecologists predicted to decrease from 1,712 physicians in 2005 to 1,251 in 2020. Adjusting for the projected population growth in the state, the demand for Obstetrician/Gynecologists expressed in terms of a physician to population ratio was predicted to decrease from 16.8 physicians per 100,000 population to 11.7 physicians per 100,000 population.

Pathology

This scenario forecast an 18 percent decrease in the demand for Pathologists between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for Pathologists predicted to decrease from 717 physicians in 2005 to 587 in 2020. Adjusting for the projected population growth in the state, the demand for Pathologists expressed in terms of a physician to population ratio was predicted to decrease from 7.0 physicians per 100,000 population to 5.5 physicians per 100,000 population.

Figure 86 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	780	10,428,683	7.5
2015	720	10,599,122	6.8
2020	650	10,695,993	6.1
Percent Change 2005-2020	-12%	5%	-16%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,128	10,428,683	30.0
2015	2,845	10,599,122	26.8
2020	2,516	10,695,993	23.5
Percent Change 2005-2020	-15%	5%	-19%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,740	10,428,683	16.7
2015	1,502	10,599,122	14.2
2020	1,251	10,695,993	11.7
Percent Change 2005-2020	-27%	5%	-30%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	750	10,428,683	7.2
2015	673	10,599,122	6.4
2020	587	10,695,993	5.5
Percent Change 2005-2020	-18%	5%	-22%

Psychiatry

This scenario forecast a 22 percent decrease in the demand for Psychiatrists between 2005 and 2020, somewhat above the rate of decline in demand predicted for non-primary care physicians, with the demand for Psychiatrists predicted to decrease from 1,357 physicians in 2005 to 1,056 in 2020. Adjusting for the projected population growth in the state, the demand for Psychiatrists expressed in terms of a physician to population ratio was predicted to decrease from 13.3 physicians per 100,000 population to 9.9 physicians per 100,000 population.

Anesthesiology

This scenario forecast a 17 percent decrease in the demand for Anesthesiologists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for Anesthesiologists predicted to decrease from 1,292 physicians in 2005 to 1,075 in 2020. Adjusting for the projected population growth in the state, the demand for Anesthesiologists expressed in terms of a physician to population ratio was predicted to decrease from 12.7 physicians per 100,000 population to 10.1 physicians per 100,000 population.

Radiology

This scenario forecast a 17 percent decrease in the demand for Radiologists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for Radiologists predicted to decrease from 1,375 physicians in 2005 to 1,140 in 2020. Adjusting for the projected population growth in the state, the demand for Radiologists expressed in terms of a physician to population ratio was predicted to decrease from 13.5 physicians per 100,000 population to 10.7 physicians per 100,000 population.

Emergency Medicine

This scenario forecast a 24 percent decrease in the demand for Emergency Medicine physicians between 2005 and 2020, somewhat above the rate of decline in demand predicted for non-primary care physicians, with the demand for Emergency Medicine physicians predicted to decrease from 1,655 physicians in 2005 to 1,264 in 2020. Adjusting for the projected population growth in the state, the demand for Emergency Medicine physicians expressed in terms of a physician to population ratio was predicted to decrease from 16.2 physicians per 100,000 population to 11.8 physicians per 100,000 population.

Figure 87 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,403	10,428,683	13.4
2015	1,237	10,599,122	11.7
2020	1,056	10,695,993	9.9
Percent Change 2005-2020	-22%	5%	-26%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,346	10,428,683	12.9
2015	1,217	10,599,122	11.5
2020	1,075	10,695,993	10.1
Percent Change 2005-2020	-17%	5%	-21%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,431	10,428,683	13.7
2015	1,291	10,599,122	12.2
2020	1,140	10,695,993	10.7
Percent Change 2005-2020	-17%	5%	-21%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,691	10,428,683	16.2
2015	1,484	10,599,122	14.0
2020	1,264	10,695,993	11.8
Percent Change 2005-2020	-24%	5%	-27%

General Surgery

This scenario forecast a 17 percent decrease in the demand for General Surgeons between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for General Surgeons predicted to decrease from 1,648 physicians in 2005 to 1,373 in 2020. Adjusting for the projected population growth in the state, the demand for General Surgeons expressed in terms of a physician to population ratio was predicted to decrease from 16.1 physicians per 100,000 population to 12.8 physicians per 100,000 population.

Ophthalmology

This scenario forecast a 15 percent decrease in the demand for Ophthalmologists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for Ophthalmologists predicted to decrease from 668 physicians in 2005 to 570 in 2020. Adjusting for the projected population growth in the state, the demand for Ophthalmologists expressed in terms of a physician to population ratio was predicted to decrease from 6.5 physicians per 100,000 population to 5.3 physicians per 100,000 population.

Otolaryngology

This scenario forecast a 21 percent decrease in the demand for Otolaryngologists between 2005 and 2020, slightly above the rate of decline in demand predicted for non-primary care physicians, with the demand for Otolaryngologists predicted to decrease from 317 physicians in 2005 to 251 in 2020. Adjusting for the projected population growth in the state, the demand for Otolaryngologists expressed in terms of a physician to population ratio was predicted to decrease from 3.1 physicians per 100,000 population to 2.3 physicians per 100,000 population.

Orthopedic Surgery

This scenario forecast an 18 percent decrease in the demand for Orthopedic Surgeons between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for Orthopedic Surgeons predicted to decrease from 844 physicians in 2005 to 695 in 2020. Adjusting for the projected population growth in the state, the demand for Orthopedic Surgeons expressed in terms of a physician to population ratio was predicted to decrease from 8.3 physicians per 100,000 population to 6.5 physicians per 100,000 population.

Figure 88 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,726	10,428,683	16.6
2015	1,562	10,599,122	14.7
2020	1,373	10,695,993	12.8
Percent Change 2005-2020	-17%	5%	-20%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	701	10,428,683	6.7
2015	639	10,599,122	6.0
2020	570	10,695,993	5.3
Percent Change 2005-2020	-15%	5%	-19%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	327	10,428,683	3.1
2015	290	10,599,122	2.7
2020	251	10,695,993	2.3
Percent Change 2005-2020	-21%	5%	-24%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	878	10,428,683	8.4
2015	791	10,599,122	7.5
2020	695	10,695,993	6.5
Percent Change 2005-2020	-18%	5%	-21%

Figure 89 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	394	10,428,683	3.8
2015	361	10,599,122	3.4
2020	323	10,695,993	3.0
Percent Change 2005-2020	-14%	5%	-18%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	598	10,428,683	5.7
2015	544	10,599,122	5.1
2020	480	10,695,993	4.5
Percent Change 2005-2020	-15%	5%	-19%

Urology

This scenario forecast a 14 percent decrease in the demand for Urologists between 2005 and 2020, well below the rate of decline in demand predicted for non-primary care physicians, with the demand for Urologists predicted to decrease from 375 physicians in 2005 to 323 in 2020. Adjusting for the projected population growth in the state, the demand for Urologists expressed in terms of a physician to population ratio was predicted to decrease from 3.7 physicians per 100,000 population to 3.0 physicians per 100,000 population.

Other Surgical Specialties

This scenario forecast a 15 percent decrease in the demand for other Surgical Specialists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for other Surgical Subspecialists predicted to decrease from 568 physicians in 2005 to 480 in 2020. Adjusting for the projected population growth in the state, the demand for other Surgical Subspecialists expressed in terms of a physician to population ratio was predicted to decrease from 5.6 physicians per 100,000 population to 4.5 physicians per 100,000 population.

State Level Demand Scenario 4: Trend and Reduction of Unnecessary Services Scenario

In this scenario, demand for physicians was forecast to decrease by 9 percent between 2005 and 2020, with the demand for physicians predicted to decrease from 30,366 physicians in 2005 to 27,482 in 2020. Adjusting for the projected population growth in the state, the demand for physicians expressed in terms of a physician to population ratio was predicted to decrease from 297 physicians per 100,000 population to 257 physicians per 100,000 population.

Figure 90 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	30,366	10,207,421	297
2010	32,687	10,428,683	313
2015	30,379	10,599,122	287
2020	27,482	10,695,993	257
Percent Change 2005-2020	-9%	5%	-14%

In this scenario, demand for primary care physicians was forecast to decrease by 15 percent between 2005 and 2020, with the demand for primary care physicians predicted to increase from 11,744 physicians in 2005 to 10,027 in 2020. Adjusting for the projected population growth in the state, the demand for primary care physicians expressed in terms of a physician to population ratio was predicted to decrease from 115 physicians per 100,000 population to 94 physicians per 100,000 population.

In this scenario, demand for non-primary care physicians was forecast to decrease by 6 percent between 2005 and 2020, with the demand for non-primary care physicians predicted to increase from 18,622 physicians in 2005 to 17,456 in 2020. Adjusting for the projected population growth in the state, the demand for non-primary care physicians expressed in terms of a physician to population ratio was predicted to decrease from 182 physicians per 100,000 population to 163 physicians per 100,000 population.

Figure 91 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,377	10,428,683	119
2015	11,286	10,599,122	106
2020	10,027	10,695,993	94
Percent Change 2005-2020	-15%	5%	-19%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	18,622	10,207,421	182
2010	20,310	10,428,683	195
2015	19,092	10,599,122	180
2020	17,456	10,695,993	163
Percent Change 2005-2020	-6%	5%	-11%

Specialty-Specific Demand Forecasts

In this scenario, the demand for physicians was forecast to decrease for all specialties. The forecast demand decline showed much variation with demand for General/Family Physicians, General Internists, General Pediatricians, Obstetrician/Gynecologists, Psychiatrists, and Emergency Medicine physicians declining at rates quicker than the demand for physicians in

general; and demand for Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Otolaryngologists, Urologists, and other Surgical Specialists declining at rates slower than the demand for physicians in general.

Primary Care Specialties

General/Family Medicine

This scenario forecast a 14 percent decrease in the demand for General/Family Physicians between 2005 and 2020, about the same rate of decline in demand predicted for primary care physicians, with the demand for General/Family Physicians predicted to decrease from 5,080 physicians in 2005 to 4,358 in 2020. Adjusting for the projected population growth in the state, the demand for General/Family Physicians expressed in terms of a physician to population ratio was predicted to decrease from 49.8 physicians per 100,000 population to 40.7 physicians per 100,000 population.

General Internal Medicine

This scenario forecast an 11 percent decrease in the demand for General Internists between 2005 and 2020, somewhat below the rate of decline in demand predicted for primary care physicians, with the demand for General Internists predicted to decrease from 4,742 physicians in 2005 to 4,225 in 2020. Adjusting for the projected population growth in the state, the demand for General Internists expressed in terms of a physician to population ratio was predicted to decrease from 46.5 physicians per 100,000 population to 39.5 physicians per 100,000 population.

General Pediatrics

This scenario forecast a 25 percent decrease in the demand for General Pediatricians between 2005 and 2020, well above the rate of decline in demand predicted for primary care physicians, with the demand for General Pediatricians predicted to decrease from 1,922 physicians in 2005 to 1,444 in 2020. Adjusting for the projected population growth in the state, the demand for General Pediatricians expressed in terms of a physician to population ratio was predicted to decrease from 18.8 physicians per 100,000 population to 13.5 physicians per 100,000 population.

Figure 92 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	11,744	10,207,421	115
2010	12,377	10,428,683	119
2015	11,286	10,599,122	106
2020	10,027	10,695,993	94
Percent Change 2005-2020	-15%	5%	-19%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,080	10,207,421	49.8
2010	5,384	10,428,683	51.6
2015	4,914	10,599,122	46.4
2020	4,358	10,695,993	40.7
Percent Change 2005-2020	-14%	5%	-18%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,742	10,207,421	46.5
2010	5,081	10,428,683	48.7
2015	4,692	10,599,122	44.3
2020	4,225	10,695,993	39.5
Percent Change 2005-2020	-11%	5%	-15%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,922	10,207,421	18.8
2010	1,912	10,428,683	18.3
2015	1,680	10,599,122	15.9
2020	1,444	10,695,993	13.5
Percent Change 2005-2020	-25%	5%	-28%

Non-Primary Care Specialties

Cardiovascular Disease

This scenario forecast a 2 percent increase in the demand for Cardiologists between 2005 and 2020, unlike the decline in demand predicted for non-primary care physicians, with the demand for Cardiologists predicted to increase from 736 physicians in 2005 to 747 in 2020. Adjusting for the projected population growth in the state, the demand for Cardiologists expressed in terms of a physician to population ratio was predicted to decrease from 7.2 physicians per 100,000 population to 7.0 physicians per 100,000 population.

Other Internal Medicine Subspecialties

This scenario forecast a 3 percent decrease in the demand for other Internal Medicine Subspecialists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for other Internal Medicine Subspecialists predicted to decrease from 2,970 physicians in 2005 to 2,894 in 2020. Adjusting for the projected population growth in the state, the demand for other Internal Medicine Subspecialists expressed in terms of a physician to population ratio was predicted to decrease from 29.1 physicians per 100,000 population to 27.1 physicians per 100,000 population.

Obstetrics and Gynecology

This scenario forecast a 16 percent decrease in the demand for Obstetrician/Gynecologists between 2005 and 2020, well above the rate of decline in demand predicted for non-primary care physicians, with the demand for Obstetrician/Gynecologists predicted to decrease from 1,712 physicians in 2005 to 1,438 in 2020. Adjusting for the projected population growth in the state, the demand for Obstetrician/Gynecologists expressed in terms of a physician to population ratio was predicted to decrease from 16.8 physicians per 100,000 population to 13.4 physicians per 100,000 population.

Pathology

This scenario forecast a 6 percent decrease in the demand for Pathologists between 2005 and 2020, about the same as the rate of decline in demand predicted for non-primary care physicians, with the demand for Pathologists predicted to decrease from 717 physicians in 2005 to 675 in 2020. Adjusting for the projected population growth in the state, the demand for Pathologists expressed in terms of a physician to population ratio was predicted to decrease from 7.0 physicians per 100,000 population to 6.3 physicians per 100,000 population.

Figure 93 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	736	10,207,421	7.2
2010	817	10,428,683	7.8
2015	791	10,599,122	7.5
2020	747	10,695,993	7.0
Percent Change 2005-2020	2%	5%	-3%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	2,970	10,207,421	29.1
2010	3,277	10,428,683	31.4
2015	3,123	10,599,122	29.5
2020	2,894	10,695,993	27.1
Percent Change 2005-2020	-3%	5%	-7%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,712	10,207,421	16.8
2010	1,824	10,428,683	17.5
2015	1,649	10,599,122	15.6
2020	1,438	10,695,993	13.4
Percent Change 2005-2020	-16%	5%	-20%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	717	10,207,421	7.0
2010	786	10,428,683	7.5
2015	739	10,599,122	7.0
2020	675	10,695,993	6.3
Percent Change 2005-2020	-6%	5%	-10%

Psychiatry

This scenario forecast a 10 percent decrease in the demand for Psychiatrists between 2005 and 2020, somewhat above the rate of decline in demand predicted for non-primary care physicians, with the demand for Psychiatrists predicted to decrease from 1,357 physicians in 2005 to 1,215 in 2020. Adjusting for the projected population growth in the state, the demand for Psychiatrists expressed in terms of a physician to population ratio was predicted to decrease from 13.3 physicians per 100,000 population to 11.4 physicians per 100,000 population.

Anesthesiology

This scenario forecast a 4 percent decrease in the demand for Anesthesiologists between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for Anesthesiologists predicted to decrease from 1,292 physicians in 2005 to 1,237 in 2020. Adjusting for the projected population growth in the state, the demand for Anesthesiologists expressed in terms of a physician to population ratio was predicted to decrease from 12.7 physicians per 100,000 population to 11.6 physicians per 100,000 population.

Radiology

This scenario forecast a 5 percent decrease in the demand for Radiologists between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for Radiologists predicted to decrease from 1,375 physicians in 2005 to 1,311 in 2020. Adjusting for the projected population growth in the state, the demand for Radiologists expressed in terms of a physician to population ratio was predicted to decrease from 13.5 physicians per 100,000 population to 12.3 physicians per 100,000 population.

Emergency Medicine

This scenario forecast a 12 percent decrease in the demand for Emergency Medicine physicians between 2005 and 2020, well above the rate of decline in demand predicted for non-primary care physicians, with the demand for Emergency Medicine physicians predicted to decrease from 1,655 physicians in 2005 to 1,454 in 2020. Adjusting for the projected population growth in the state, the demand for Emergency Medicine physicians expressed in terms of a physician to population ratio was predicted to decrease from 16.2 physicians per 100,000 population to 13.6 physicians per 100,000 population.

Figure 94 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,357	10,207,421	13.3
2010	1,470	10,428,683	14.1
2015	1,358	10,599,122	12.8
2020	1,215	10,695,993	11.4
Percent Change 2005-2020	-10%	5%	-15%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,292	10,207,421	12.7
2010	1,410	10,428,683	13.5
2015	1,336	10,599,122	12.6
2020	1,237	10,695,993	11.6
Percent Change 2005-2020	-4%	5%	-9%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,375	10,207,421	13.5
2010	1,500	10,428,683	14.4
2015	1,418	10,599,122	13.4
2020	1,311	10,695,993	12.3
Percent Change 2005-2020	-5%	5%	-9%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,655	10,207,421	16.2
2010	1,772	10,428,683	17.0
2015	1,629	10,599,122	15.4
2020	1,454	10,695,993	13.6
Percent Change 2005-2020	-12%	5%	-16%

General Surgery

This scenario forecast a 4 percent decrease in the demand for General Surgeons between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for General Surgeons predicted to decrease from 1,648 physicians in 2005 to 1,580 in 2020. Adjusting for the projected population growth in the state, the demand for General Surgeons expressed in terms of a physician to population ratio was predicted to decrease from 16.1 physicians per 100,000 population to 14.8 physicians per 100,000 population.

Ophthalmology

This scenario forecast a 2 percent decrease in the demand for Ophthalmologists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for Ophthalmologists predicted to decrease from 668 physicians in 2005 to 655 in 2020. Adjusting for the projected population growth in the state, the demand for Ophthalmologists expressed in terms of a physician to population ratio was predicted to decrease from 6.5 physicians per 100,000 population to 6.1 physicians per 100,000 population.

Otolaryngology

This scenario forecast a 9 percent decrease in the demand for Otolaryngologists between 2005 and 2020, slightly above the rate of decline in demand predicted for non-primary care physicians, with the demand for Otolaryngologists predicted to decrease from 317 physicians in 2005 to 289 in 2020. Adjusting for the projected population growth in the state, the demand for Otolaryngologists expressed in terms of a physician to population ratio was predicted to decrease from 3.1 physicians per 100,000 population to 2.7 physicians per 100,000 population.

Orthopedic Surgery

This scenario forecast a 5 percent decrease in the demand for Orthopedic Surgeons between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for Orthopedic Surgeons predicted to decrease from 844 physicians in 2005 to 799 in 2020. Adjusting for the projected population growth in the state, the demand for Orthopedic Surgeons expressed in terms of a physician to population ratio was predicted to decrease from 8.3 physicians per 100,000 population to 7.5 physicians per 100,000 population.

Figure 95 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,648	10,207,421	16.1
2010	1,809	10,428,683	17.3
2015	1,715	10,599,122	16.2
2020	1,580	10,695,993	14.8
Percent Change 2005-2020	-4%	5%	-9%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	668	10,207,421	6.5
2010	734	10,428,683	7.0
2015	702	10,599,122	6.6
2020	655	10,695,993	6.1
Percent Change 2005-2020	-2%	5%	-6%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	317	10,207,421	3.1
2010	343	10,428,683	3.3
2015	319	10,599,122	3.0
2020	289	10,695,993	2.7
Percent Change 2005-2020	-9%	5%	-13%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	844	10,207,421	8.3
2010	921	10,428,683	8.8
2015	868	10,599,122	8.2
2020	799	10,695,993	7.5
Percent Change 2005-2020	-5%	5%	-10%

Urology

This scenario forecast a 1 percent decrease in the demand for Urologists between 2005 and 2020, somewhat below the rate of decline in demand predicted for non-primary care physicians, with the demand for Urologists predicted to decrease from 375 physicians in 2005 to 371 in 2020. Adjusting for the projected population growth in the state, the demand for Urologists expressed in terms of a physician to population ratio was predicted to decrease slightly from 3.7 physicians per 100,000 population to 3.5 physicians per 100,000 population.

Other Surgical Specialties

This scenario forecast a 3 percent decrease in the demand for other Surgical Specialists between 2005 and 2020, slightly below the rate of decline in demand predicted for non-primary care physicians, with the demand for other Surgical Subspecialists predicted to decrease from 568 physicians in 2005 to 552 in 2020. Adjusting for the projected population growth in the state, the demand for other Surgical Subspecialists expressed in terms of a physician to population ratio was predicted to decrease from 5.6 physicians per 100,000 population to 5.2 physicians per 100,000 population.

Figure 96 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	375	10,207,421	3.7
2010	413	10,428,683	4.0
2015	397	10,599,122	3.7
2020	371	10,695,993	3.5
Percent Change 2005-2020	-1%	5%	-5%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	568	10,207,421	5.6
2010	627	10,428,683	6.0
2015	597	10,599,122	5.6
2020	552	10,695,993	5.2
Percent Change 2005-2020	-3%	5%	-7%

Full Insurance Environment

The demand forecasts in each scenario of the full insurance environment were very similar to those of the constant insurance environment. In fact, all of the predicted relative changes between 2005 and 2020 were the same within scenarios. For example, while the growth in non-primary care demand in the trend scenario of the constant insurance environment was 29 percent (p. 88, Figure 77), the growth in the same specialty group in the full insurance environment was also 29 percent (p. 110, Figure 105). As noted in the description of the full insurance environment, this environment increases the demand for physicians initially, and then allows the scenarios to determine the trajectory of demand thereafter.

State Level Demand Scenario 1: Demographic Only Scenario

Figure 97 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	31,835	10,207,421	312
2010	33,012	10,428,683	317
2015	34,267	10,599,122	323
2020	35,526	10,695,993	332
Percent Change 2005-2020	12%	5%	6%

Figure 98 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,596	10,428,683	121
2015	13,030	10,599,122	123
2020	13,478	10,695,993	126
Percent Change 2005-2020	10%	5%	5%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	19,617	10,207,421	192
2010	20,417	10,428,683	196
2015	21,237	10,599,122	200
2020	22,048	10,695,993	206
Percent Change 2005-2020	12%	5%	7%

Figure 99 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,596	10,428,683	121
2015	13,030	10,599,122	123
2020	13,478	10,695,993	126
Percent Change 2005-2020	10%	5%	5%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,253	10,207,421	51.5
2010	5,447	10,428,683	52.2
2015	5,639	10,599,122	53.2
2020	5,823	10,695,993	54.4
Percent Change 2005-2020	11%	5%	6%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,965	10,207,421	48.6
2010	5,203	10,428,683	49.9
2015	5,452	10,599,122	51.4
2020	5,715	10,695,993	53.4
Percent Change 2005-2020	15%	5%	10%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,999	10,207,421	19.6
2010	1,946	10,428,683	18.7
2015	1,939	10,599,122	18.3
2020	1,940	10,695,993	18.1
Percent Change 2005-2020	-3%	5%	-7%

Figure 100 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	765	10,207,421	7.5
2010	811	10,428,683	7.8
2015	868	10,599,122	8.2
2020	932	10,695,993	8.7
Percent Change 2005-2020	22%	5%	16%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	3,122	10,207,421	30.6
2010	3,288	10,428,683	31.5
2015	3,468	10,599,122	32.7
2020	3,648	10,695,993	34.1
Percent Change 2005-2020	17%	5%	12%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,869	10,207,421	18.3
2010	1,900	10,428,683	18.2
2015	1,902	10,599,122	17.9
2020	1,884	10,695,993	17.6
Percent Change 2005-2020	1%	5%	-4%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	759	10,207,421	7.4
2010	794	10,428,683	7.6
2015	827	10,599,122	7.8
2020	857	10,695,993	8.0
Percent Change 2005-2020	13%	5%	8%

Figure 101 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,406	10,428,683	13.5
2015	1,438	10,599,122	13.6
2020	1,460	10,695,993	13.7
Percent Change 2005-2020	7%	5%	2%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,417	10,428,683	13.6
2015	1,485	10,599,122	14.0
2020	1,561	10,695,993	14.6
Percent Change 2005-2020	15%	5%	10%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,455	10,207,421	14.3
2010	1,514	10,428,683	14.5
2015	1,584	10,599,122	14.9
2020	1,663	10,695,993	15.6
Percent Change 2005-2020	14%	5%	9%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,713	10,207,421	16.8
2010	1,750	10,428,683	16.8
2015	1,781	10,599,122	16.8
2020	1,804	10,695,993	16.9
Percent Change 2005-2020	5%	5%	1%

Figure 102 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,734	10,207,421	17.0
2010	1,817	10,428,683	17.4
2015	1,907	10,599,122	18.0
2020	1,994	10,695,993	18.6
Percent Change 2005-2020	15%	5%	10%

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,734	10,207,421	17.0
2010	1,817	10,428,683	17.4
2015	1,907	10,599,122	18.0
2020	1,994	10,695,993	18.6
Percent Change 2005-2020	15%	5%	10%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	338	10,207,421	3.3
2010	349	10,428,683	3.3
2015	359	10,599,122	3.4
2020	369	10,695,993	3.5
Percent Change 2005-2020	9%	5%	4%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	901	10,207,421	8.8
2010	938	10,428,683	9.0
2015	979	10,599,122	9.2
2020	1,023	10,695,993	9.6
Percent Change 2005-2020	14%	5%	8%

Figure 103 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	393	10,207,421	3.8
2010	413	10,428,683	4.0
2015	439	10,599,122	4.1
2020	466	10,695,993	4.4
Percent Change 2005-2020	19%	5%	13%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	597	10,207,421	5.8
2010	628	10,428,683	6.0
2015	663	10,599,122	6.3
2020	696	10,695,993	6.5
Percent Change 2005-2020	17%	5%	11%

State Level Demand Scenario 2: Trend Scenario

Figure 104 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	31,835	10,207,421	312
2010	34,271	10,428,683	329
2015	36,931	10,599,122	348
2020	39,748	10,695,993	372
Percent Change 2005-2020	25%	5%	19%

Figure 105 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,876	10,428,683	123
2015	13,614	10,599,122	128
2020	14,389	10,695,993	135
Percent Change 2005-2020	18%	5%	12%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	19,617	10,207,421	192
2010	21,395	10,428,683	205
2015	23,317	10,599,122	220
2020	25,359	10,695,993	237
Percent Change 2005-2020	29%	5%	23%

Figure 106 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,876	10,428,683	123
2015	13,614	10,599,122	128
2020	14,389	10,695,993	135
Percent Change 2005-2020	18%	5%	12%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,253	10,207,421	51.5
2010	5,568	10,428,683	53.4
2015	5,891	10,599,122	55.6
2020	6,217	10,695,993	58.1
Percent Change 2005-2020	18%	5%	13%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,965	10,207,421	48.6
2010	5,319	10,428,683	51.0
2015	5,696	10,599,122	53.7
2020	6,101	10,695,993	57.0
Percent Change 2005-2020	23%	5%	17%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,999	10,207,421	19.6
2010	1,989	10,428,683	19.1
2015	2,026	10,599,122	19.1
2020	2,071	10,695,993	19.4
Percent Change 2005-2020	4%	5%	-1%

Figure 107 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	765	10,207,421	7.5
2010	850	10,428,683	8.2
2015	953	10,599,122	9.0
2020	1,072	10,695,993	10.0
Percent Change 2005-2020	40%	5%	34%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	3,122	10,207,421	30.6
2010	3,446	10,428,683	33.0
2015	3,807	10,599,122	35.9
2020	4,196	10,695,993	39.2
Percent Change 2005-2020	34%	5%	28%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,869	10,207,421	18.3
2010	1,991	10,428,683	19.1
2015	2,088	10,599,122	19.7
2020	2,166	10,695,993	20.3
Percent Change 2005-2020	16%	5%	11%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	759	10,207,421	7.4
2010	832	10,428,683	8.0
2015	908	10,599,122	8.6
2020	985	10,695,993	9.2
Percent Change 2005-2020	30%	5%	24%

Figure 108 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,473	10,428,683	14.1
2015	1,578	10,599,122	14.9
2020	1,679	10,695,993	15.7
Percent Change 2005-2020	23%	5%	18%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,485	10,428,683	14.2
2015	1,631	10,599,122	15.4
2020	1,796	10,695,993	16.8
Percent Change 2005-2020	32%	5%	26%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,455	10,207,421	14.3
2010	1,586	10,428,683	15.2
2015	1,739	10,599,122	16.4
2020	1,913	10,695,993	17.9
Percent Change 2005-2020	32%	5%	26%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,713	10,207,421	16.8
2010	1,834	10,428,683	17.6
2015	1,955	10,599,122	18.4
2020	2,075	10,695,993	19.4
Percent Change 2005-2020	21%	5%	16%

Figure 109 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,734	10,207,421	17.0
2010	1,904	10,428,683	18.3
2015	2,093	10,599,122	19.8
2020	2,293	10,695,993	21.4
Percent Change 2005-2020	32%	5%	26%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	681	10,207,421	6.7
2010	748	10,428,683	7.2
2015	829	10,599,122	7.8
2020	921	10,695,993	8.6
Percent Change 2005-2020	35%	5%	29%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	338	10,207,421	3.3
2010	365	10,428,683	3.5
2015	394	10,599,122	3.7
2020	425	10,695,993	4.0
Percent Change 2005-2020	26%	5%	20%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	901	10,207,421	8.8
2010	983	10,428,683	9.4
2015	1,075	10,599,122	10.1
2020	1,177	10,695,993	11.0
Percent Change 2005-2020	31%	5%	25%

Figure 110 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	393	10,207,421	3.8
2010	433	10,428,683	4.2
2015	482	10,599,122	4.5
2020	536	10,695,993	5.0
Percent Change 2005-2020	37%	5%	30%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	597	10,207,421	5.8
2010	659	10,428,683	6.3
2015	728	10,599,122	6.9
2020	800	10,695,993	7.5
Percent Change 2005-2020	34%	5%	28%

State Level Demand Scenario 3: Demographic and Reduction of Unnecessary Services Scenario

Figure 111 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	31,835	10,207,421	312
2010	33,012	10,428,683	317
2015	29,555	10,599,122	279
2020	25,756	10,695,993	241
Percent Change 2005-2020	-19%	5%	-23%

Figure 112 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,596	10,428,683	121
2015	11,238	10,599,122	106
2020	9,771	10,695,993	91
Percent Change 2005-2020	-20%	5%	-24%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	19,617	10,207,421	192
2010	20,417	10,428,683	196
2015	18,317	10,599,122	173
2020	15,985	10,695,993	149
Percent Change 2005-2020	-19%	5%	-22%

Figure 113 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,596	10,428,683	121
2015	11,238	10,599,122	106
2020	9,771	10,695,993	91
Percent Change 2005-2020	-20%	5%	-24%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,253	10,207,421	51.5
2010	5,447	10,428,683	52.2
2015	4,864	10,599,122	45.9
2020	4,222	10,695,993	39.5
Percent Change 2005-2020	-20%	5%	-23%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,965	10,207,421	48.6
2010	5,203	10,428,683	49.9
2015	4,702	10,599,122	44.4
2020	4,143	10,695,993	38.7
Percent Change 2005-2020	-17%	5%	-20%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,999	10,207,421	19.6
2010	1,946	10,428,683	18.7
2015	1,673	10,599,122	15.8
2020	1,406	10,695,993	13.1
Percent Change 2005-2020	-30%	5%	-33%

Figure 114 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	765	10,207,421	7.5
2010	811	10,428,683	7.8
2015	749	10,599,122	7.1
2020	676	10,695,993	6.3
Percent Change 2005-2020	-12%	5%	-16%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	3,122	10,207,421	30.6
2010	3,288	10,428,683	31.5
2015	2,991	10,599,122	28.2
2020	2,645	10,695,993	24.7
Percent Change 2005-2020	-15%	5%	-19%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,869	10,207,421	18.3
2010	1,900	10,428,683	18.2
2015	1,640	10,599,122	15.5
2020	1,366	10,695,993	12.8
Percent Change 2005-2020	-27%	5%	-30%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	759	10,207,421	7.4
2010	794	10,428,683	7.6
2015	713	10,599,122	6.7
2020	621	10,695,993	5.8
Percent Change 2005-2020	-18%	5%	-22%

Figure 115 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,406	10,428,683	13.5
2015	1,240	10,599,122	11.7
2020	1,059	10,695,993	9.9
Percent Change 2005-2020	-22%	5%	-26%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,417	10,428,683	13.6
2015	1,281	10,599,122	12.1
2020	1,132	10,695,993	10.6
Percent Change 2005-2020	-17%	5%	-21%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,455	10,207,421	14.3
2010	1,514	10,428,683	14.5
2015	1,366	10,599,122	12.9
2020	1,206	10,695,993	11.3
Percent Change 2005-2020	-17%	5%	-21%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,713	10,207,421	16.8
2010	1,750	10,428,683	16.8
2015	1,536	10,599,122	14.5
2020	1,308	10,695,993	12.2
Percent Change 2005-2020	-24%	5%	-27%

Figure 116 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,734	10,207,421	17.0
2010	1,817	10,428,683	17.4
2015	1,644	10,599,122	15.5
2020	1,446	10,695,993	13.5
Percent Change 2005-2020	-17%	5%	-20%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	681	10,207,421	6.7
2010	713	10,428,683	6.8
2015	651	10,599,122	6.1
2020	580	10,695,993	5.4
Percent Change 2005-2020	-15%	5%	-19%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	338	10,207,421	3.3
2010	349	10,428,683	3.3
2015	310	10,599,122	2.9
2020	268	10,695,993	2.5
Percent Change 2005-2020	-21%	5%	-24%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	901	10,207,421	8.8
2010	938	10,428,683	9.0
2015	844	10,599,122	8.0
2020	742	10,695,993	6.9
Percent Change 2005-2020	-18%	5%	-21%

Figure 117 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	393	10,207,421	3.8
2010	413	10,428,683	4.0
2015	379	10,599,122	3.6
2020	338	10,695,993	3.2
Percent Change 2005-2020	-14%	5%	-18%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	597	10,207,421	5.8
2010	628	10,428,683	6.0
2015	572	10,599,122	5.4
2020	504	10,695,993	4.7
Percent Change 2005-2020	-15%	5%	-19%

State Level Demand Scenario 4: Trend and Reduction of Unnecessary Services Scenario

Figure 118 – Michigan Physician Demand, 2005-2020

Year	Physicians	Population	Physicians per 100,000 Population
2005	31,835	10,207,421	312
2010	34,271	10,428,683	329
2015	31,853	10,599,122	301
2020	28,817	10,695,993	269
Percent Change 2005-2020	-9%	5%	-14%

Figure 119 – Michigan Primary Care and Non-Primary Care Physician Demand, 2005-2020

Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,876	10,428,683	123
2015	11,742	10,599,122	111
2020	10,432	10,695,993	98
Percent Change 2005-2020	-15%	5%	-19%

Non-Primary Care

Year	Physicians	Population	Physicians per 100,000 Population
2005	19,617	10,207,421	192
2010	21,395	10,428,683	205
2015	20,111	10,599,122	190
2020	18,385	10,695,993	172
Percent Change 2005-2020	-6%	5%	-11%

Figure 120 – Michigan Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Primary Care (Overall)

Year	Physicians	Population	Physicians per 100,000 Population
2005	12,218	10,207,421	120
2010	12,876	10,428,683	123
2015	11,742	10,599,122	111
2020	10,432	10,695,993	98
Percent Change 2005-2020	-15%	5%	-19%

General/Family Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	5,253	10,207,421	51.5
2010	5,568	10,428,683	53.4
2015	5,081	10,599,122	47.9
2020	4,507	10,695,993	42.1
Percent Change 2005-2020	-14%	5%	-18%

General Internal Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	4,965	10,207,421	48.6
2010	5,319	10,428,683	51.0
2015	4,913	10,599,122	46.4
2020	4,423	10,695,993	41.4
Percent Change 2005-2020	-11%	5%	-15%

General Pediatrics

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,999	10,207,421	19.6
2010	1,989	10,428,683	19.1
2015	1,748	10,599,122	16.5
2020	1,502	10,695,993	14.0
Percent Change 2005-2020	-25%	5%	-28%

Figure 121 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Cardiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	765	10,207,421	7.5
2010	850	10,428,683	8.2
2015	822	10,599,122	7.8
2020	777	10,695,993	7.3
Percent Change 2005-2020	2%	5%	-3%

Other Internal Medicine Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	3,122	10,207,421	30.6
2010	3,446	10,428,683	33.0
2015	3,284	10,599,122	31.0
2020	3,042	10,695,993	28.4
Percent Change 2005-2020	-3%	5%	-7%

Obstetrics and Gynecology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,869	10,207,421	18.3
2010	1,991	10,428,683	19.1
2015	1,801	10,599,122	17.0
2020	1,571	10,695,993	14.7
Percent Change 2005-2020	-16%	5%	-20%

Pathology

Year	Physicians	Population	Physicians per 100,000 Population
2005	759	10,207,421	7.4
2010	832	10,428,683	8.0
2015	783	10,599,122	7.4
2020	714	10,695,993	6.7
Percent Change 2005-2020	-6%	5%	-10%

Figure 122 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Psychiatry

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,473	10,428,683	14.1
2015	1,361	10,599,122	12.8
2020	1,218	10,695,993	11.4
Percent Change 2005-2020	-10%	5%	-15%

Anesthesiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,360	10,207,421	13.3
2010	1,485	10,428,683	14.2
2015	1,406	10,599,122	13.3
2020	1,302	10,695,993	12.2
Percent Change 2005-2020	-4%	5%	-9%

Radiology

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,455	10,207,421	14.3
2010	1,586	10,428,683	15.2
2015	1,500	10,599,122	14.1
2020	1,387	10,695,993	13.0
Percent Change 2005-2020	-5%	5%	-9%

Emergency Medicine

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,713	10,207,421	16.8
2010	1,834	10,428,683	17.6
2015	1,686	10,599,122	15.9
2020	1,505	10,695,993	14.1
Percent Change 2005-2020	-12%	5%	-16%

Figure 123 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

General Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	1,734	10,207,421	17.0
2010	1,904	10,428,683	18.3
2015	1,806	10,599,122	17.0
2020	1,663	10,695,993	15.5
Percent Change 2005-2020	-4%	5%	-9%

Ophthalmology

Year	Physicians	Population	Physicians per 100,000 Population
2005	681	10,207,421	6.7
2010	748	10,428,683	7.2
2015	715	10,599,122	6.7
2020	667	10,695,993	6.2
Percent Change 2005-2020	-2%	5%	-6%

Otolaryngology

Year	Physicians	Population	Physicians per 100,000 Population
2005	338	10,207,421	3.3
2010	365	10,428,683	3.5
2015	340	10,599,122	3.2
2020	308	10,695,993	2.9
Percent Change 2005-2020	-9%	5%	-13%

Orthopedic Surgery

Year	Physicians	Population	Physicians per 100,000 Population
2005	901	10,207,421	8.8
2010	983	10,428,683	9.4
2015	927	10,599,122	8.7
2020	853	10,695,993	8.0
Percent Change 2005-2020	-5%	5%	-10%

Figure 124 – Michigan Non-Primary Care Physician Demand: Detailed Specialty Forecasts, 2005-2020

Urology

Year	Physicians	Population	Physicians per 100,000 Population
2005	393	10,207,421	3.8
2010	433	10,428,683	4.2
2015	416	10,599,122	3.9
2020	389	10,695,993	3.6
Percent Change 2005-2020	-1%	5%	-5%

Other Surgical Subspecialties

Year	Physicians	Population	Physicians per 100,000 Population
2005	597	10,207,421	5.8
2010	659	10,428,683	6.3
2015	628	10,599,122	5.9
2020	580	10,695,993	5.4
Percent Change 2005-2020	-3%	5%	-7%

Regional Physician Demand, 2005-2020

Regional physician demand forecasts were generated under two scenarios: the demographic only baseline scenario and the trend scenario (refer to the beginning of Chapter 8 for a discussion of

the assumptions made under each scenario). Also, note that only one insurance environment was developed for the regional scenarios: the constant insurance scenario. It is also important to note that because the forecast rates of population growth were variable across regions, the most indicative statistic of the change in physician demand is the one expressed as a physician to population ratio.

Regional Demand Scenario 1: Demographic Only Scenario

In this scenario, the demand for physicians was forecast to grow by 29 percent in the Ann Arbor Area region. Demand for primary care physicians was forecast to grow by 27 percent, while demand for non-primary care physicians was forecast to grow by 30 percent. Even though these forecast growth rates were greater than the statewide rate of growth, due to the higher rate of population growth predicted for the region (17 percent), demand expressed as a physician to population ratio was forecast to grow at a much slower pace (10 percent). Further, demand for Pediatricians and Obstetrician/Gynecologists was forecast to grow more slowly than the forecast rate of population growth in the region, resulting in a decline in the demand for these specialties expressed as a physician to population ratio. However, even after accounting for the forecast population growth, in many specialties, especially Cardiology, Ophthalmology, and Urology, demand was forecast to grow substantially over the forecast period.

Figure 125 – Ann Arbor Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**3,546**	**672**	**4,575**	**743**	**29%**	**10%**
Primary Care	*988*	*187*	*1,259*	*204*	*27%*	*9%*
General/Family Medicine	234	44	297	48	27%	8%
General Internal Medicine	543	103	732	119	35%	15%
General Pediatrics	211	40	229	37	9%	-7%
Non-Primary Care	*2,557*	*485*	*3,316*	*538*	*30%*	*11%*
Cardiovascular Diseases	89	17	132	21	48%	26%
Other Internal Medicine Subspecialties	532	101	720	117	36%	16%
Obstetrics and Gynecology	154	29	172	28	12%	-4%
Pathology	117	22	150	24	28%	10%
Psychiatry	221	42	264	43	20%	2%
Anesthesiology	183	35	241	39	32%	13%
Radiology	160	30	214	35	34%	15%
Emergency Medicine	149	28	176	29	18%	1%
General Surgery	182	34	243	39	34%	15%
Ophthalmology	66	12	92	15	40%	20%
Otolaryngology	45	8	53	9	19%	2%
Orthopedic Surgery	88	17	113	18	29%	10%
Urology	50	9	69	11	39%	19%
Other Surgical Specialties	93	18	123	20	32%	13%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 126 – Detroit Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**14,632**	**342**	**15,527**	**357**	**6%**	**4%**
Primary Care	*5,518*	*129*	*5,834*	*134*	*6%*	*4%*
General/Family Medicine	1,934	45	2,061	47	7%	5%
General Internal Medicine	2,579	60	2,832	65	10%	8%
General Pediatrics	1,006	24	941	22	-6%	-8%
Non-Primary Care	*9,114*	*213*	*9,693*	*223*	*6%*	*5%*
Cardiovascular Diseases	369	9	420	10	14%	12%
Other Internal Medicine Subspecialties	1,489	35	1,629	37	9%	8%
Obstetrics and Gynecology	886	21	869	20	-2%	-3%
Pathology	374	9	398	9	6%	5%
Psychiatry	657	15	672	15	2%	1%
Anesthesiology	574	13	618	14	8%	6%
Radiology	686	16	741	17	8%	6%
Emergency Medicine	750	18	760	17	1%	0%
General Surgery	802	19	874	20	9%	7%
Ophthalmology	348	8	386	9	11%	9%
Otolaryngology	141	3	146	3	4%	2%
Orthopedic Surgery	358	8	383	9	7%	5%
Urology	181	4	202	5	12%	10%
Other Surgical Specialties	266	6	290	7	9%	7%
		Projected Regional Population Change 2005-2020:				*2%*

In this scenario, the demand for physicians was forecast to grow by 6 percent in the Detroit Area region. Demand for primary care physicians was forecast to grow by 6 percent, and demand for non-primary care physicians was forecast to grow by 6 percent as well. Even though these forecast growth rates were lower than the statewide rate of growth, due to the low rate of population growth predicted for the region (2 percent), demand expressed as a physician to population ratio was forecast to grow at a similar pace (4 percent). Further, demand for Pediatricians and Obstetrician/Gynecologists was forecast to decline during the forecast period in the region.

In this scenario, the demand for physicians was forecast to grow by 16 percent in the East Central region. Demand for primary care physicians was forecast to grow by 17 percent, while demand for non-primary care physicians was forecast to grow by 15 percent. Even though these forecast growth rates were greater than the statewide rate of growth, due to the rate of population growth predicted for the region (9 percent), demand expressed as a physician to population ratio was forecast to grow at a similar pace (6 percent). Demand for Pediatricians and Otolaryngologists was forecast to decline during the forecast period in the region. Further, demand for these two specialties, as well as Obstetrician/Gynecologists, was forecast to grow more slowly than the forecast rate of population growth in the region, resulting in a decline in the demand for these specialties expressed as a physician to population ratio.

Figure 127 – East Central Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**151**	**100**	**175**	**106**	**16%**	**6%**
Primary Care	*88*	*59*	*103*	*63*	*17%*	*7%*
General/Family Medicine	55	37	65	39	17%	7%
General Internal Medicine	26	18	32	19	21%	11%
General Pediatrics	7	4	6	4	-6%	-14%
Non-Primary Care	*63*	*42*	*72*	*44*	*15%*	*5%*
Cardiovascular Diseases	1	1	1	1	27%	16%
Other Internal Medicine Subspecialties	12	8	15	9	23%	13%
Obstetrics and Gynecology	9	6	9	5	0%	-9%
Pathology	3	2	4	2	13%	3%
Psychiatry	2	1	2	2	16%	6%
Anesthesiology	2	1	3	2	19%	9%
Radiology	1	1	1	1	19%	9%
Emergency Medicine	11	7	12	7	13%	3%
General Surgery	11	7	13	8	19%	9%
Ophthalmology	2	1	3	2	21%	11%
Otolaryngology	4	3	4	3	-1%	-10%
Orthopedic Surgery	0	0	0	0	--	--
Urology	1	1	1	1	18%	8%
Other Surgical Specialties	1	1	1	1	26%	15%
			Projected Regional Population Change 2005-2020:			*9%*

Figure 128 – Flint Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,425**	**276**	**1,483**	**292**	**4%**	**6%**
Primary Care	*748*	*145*	*776*	*153*	*4%*	*6%*
General/Family Medicine	376	73	389	77	4%	6%
General Internal Medicine	286	55	306	60	7%	9%
General Pediatrics	86	17	80	16	-7%	-5%
Non-Primary Care	*676*	*131*	*707*	*139*	*5%*	*7%*
Cardiovascular Diseases	27	5	31	6	13%	15%
Other Internal Medicine Subspecialties	121	23	130	26	7%	9%
Obstetrics and Gynecology	79	15	75	15	-5%	-3%
Pathology	25	5	26	5	5%	7%
Psychiatry	34	7	35	7	1%	3%
Anesthesiology	47	9	50	10	6%	8%
Radiology	79	15	85	17	7%	9%
Emergency Medicine	48	9	48	9	-1%	1%
General Surgery	63	12	67	13	7%	9%
Ophthalmology	19	4	21	4	11%	14%
Otolaryngology	12	2	12	2	-1%	1%
Orthopedic Surgery	34	6	36	7	6%	8%
Urology	10	2	11	2	9%	11%
Other Surgical Specialties	22	4	24	5	9%	11%
			Projected Regional Population Change 2005-2020:			*-2%*

In this scenario, the demand for physicians was forecast to grow by 4 percent in the Flint Area region. Demand for primary care physicians was forecast to grow by 4 percent, while demand for non-primary care physicians was forecast to grow by 5 percent. Even though these forecast growth rates were lower than the statewide rate of growth, due to the rate of population decline predicted for the region (2 percent), demand expressed as a physician to population ratio was forecast to grow at a relatively similar pace (6 percent). However, demand for a number of specialties (including, Pediatricians, Obstetrician/Gynecologists, Emergency Medicine physicians, and Otolaryngologists) was forecast to decline during the forecast period in the region.

In this scenario, the demand for physicians was forecast to grow by 19 percent in the Grand Rapids-Muskegon Area region. Demand for primary care physicians was forecast to grow by 18 percent, while demand for non-primary care physicians was forecast to grow by 20 percent. Even though these forecast growth rates were higher than the statewide rate of growth, due to the high rate of population growth predicted for the region (14 percent), demand expressed as a physician to population ratio was forecast to grow at a slightly slower pace (4 percent). In nearly all specialties, the growth in demand expressed as a physician to population ratio was forecast to increase at a slightly slower pace in the region than at the state level.

Figure 129 – Grand Rapids-Muskegon Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**2,756**	**233**	**3,291**	**243**	**19%**	**4%**
Primary Care	*1,053*	*89*	*1,248*	*92*	*18%*	*4%*
General/Family Medicine	547	46	652	48	19%	4%
General Internal Medicine	333	28	412	30	24%	8%
General Pediatrics	173	15	185	14	7%	-7%
Non-Primary Care	*1,702*	*144*	*2,043*	*151*	*20%*	*5%*
Cardiovascular Diseases	45	4	58	4	29%	13%
Other Internal Medicine Subspecialties	221	19	273	20	24%	8%
Obstetrics and Gynecology	180	15	199	15	10%	-3%
Pathology	54	5	66	5	21%	6%
Psychiatry	85	7	99	7	17%	2%
Anesthesiology	157	13	191	14	21%	6%
Radiology	129	11	157	12	22%	7%
Emergency Medicine	195	16	223	16	14%	0%
General Surgery	165	14	202	15	23%	7%
Ophthalmology	64	5	79	6	24%	9%
Otolaryngology	30	3	36	3	20%	5%
Orthopedic Surgery	116	10	140	10	20%	5%
Urology	38	3	47	3	26%	10%
Other Surgical Specialties	70	6	87	6	24%	9%
			Projected Regional Population Change 2005-2020:			*14%*

In this scenario, the demand for physicians was forecast to grow by 11 percent in the Jackson Area region. Demand for primary care physicians was forecast to grow by 10 percent, while demand for non-primary care physicians was forecast to grow by 13 percent. Compared to the forecasts at the state level, the region was forecast to have a very similar experience. Some notable exceptions included that the regional demand for Cardiologists and Ophthalmologists was forecast to grow at a slightly higher rate than at the state level.

Figure 130 – Jackson Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**605**	**130**	**674**	**140**	**11%**	**7%**
Primary Care	*253*	*54*	*277*	*58*	*10%*	*6%*
General/Family Medicine	135	29	149	31	10%	6%
General Internal Medicine	79	17	91	19	16%	12%
General Pediatrics	39	8	37	8	-6%	-9%
Non-Primary Care	*352*	*76*	*397*	*82*	*13%*	*9%*
Cardiovascular Diseases	17	4	21	4	25%	20%
Other Internal Medicine Subspecialties	54	12	64	13	19%	15%
Obstetrics and Gynecology	29	6	29	6	0%	-4%
Pathology	12	3	14	3	15%	11%
Psychiatry	31	7	33	7	7%	4%
Anesthesiology	30	6	34	7	15%	10%
Radiology	22	5	25	5	15%	11%
Emergency Medicine	31	7	32	7	4%	1%
General Surgery	32	7	36	8	15%	10%
Ophthalmology	18	4	22	4	18%	14%
Otolaryngology	10	2	11	2	8%	4%
Orthopedic Surgery	17	4	20	4	13%	9%
Urology	7	2	9	2	18%	14%
Other Surgical Specialties	4	1	5	1	16%	11%
			Projected Regional Population Change 2005-2020:			*4%*

In this scenario, the demand for physicians was forecast to grow by 8 percent in the Kalamazoo-Battle Creek region. Demand for primary care physicians was forecast to grow by 8 percent, while demand for non-primary care physicians was forecast to grow by 9 percent. Compared to the forecasts at the state level, the region was forecast to have a somewhat similar experience. Some notable exceptions included that the regional demand for a number of specialties (including Cardiology, other Internal Medicine subspecialties, Pathology, Anesthesiology, General Surgery, Urology, and other surgical specialties) was forecast to grow at a slightly lower rate than at the state level. Demand for Otolaryngologists was forecast to grow at a higher rate in the region than at the state level.

Figure 131 – Kalamazoo-Battle Creek Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,521**	**275**	**1,647**	**287**	**8%**	**4%**
Primary Care	*576*	*104*	*621*	*108*	*8%*	*4%*
General/Family Medicine	254	46	276	48	8%	5%
General Internal Medicine	214	39	239	42	12%	8%
General Pediatrics	107	19	106	19	-1%	-4%
Non-Primary Care	*945*	*171*	*1,026*	*179*	*9%*	*5%*
Cardiovascular Diseases	38	7	44	8	16%	12%
Other Internal Medicine Subspecialties	146	26	164	29	13%	8%
Obstetrics and Gynecology	69	12	68	12	-1%	-5%
Pathology	27	5	30	5	8%	4%
Psychiatry	99	18	105	18	6%	2%
Anesthesiology	51	9	56	10	9%	5%
Radiology	53	9	59	10	12%	8%
Emergency Medicine	127	23	132	23	3%	0%
General Surgery	83	15	91	16	10%	6%
Ophthalmology	30	5	35	6	14%	10%
Otolaryngology	15	3	17	3	13%	9%
Orthopedic Surgery	60	11	66	11	10%	6%
Urology	17	3	19	3	14%	10%
Other Surgical Specialties	28	5	32	6	12%	8%
		Projected Regional Population Change 2005-2020:				*4%*

In this scenario, the demand for physicians was forecast to grow by 13 percent in the Lansing Area region. Demand for primary care physicians was forecast to grow by 12 percent, while demand for non-primary care physicians was forecast to grow by 13 percent. While the region's population was forecast to grow at about the same rate as the state (5 percent), the demand for physicians a substantial number of specialties was forecast to grow at a more rapid pace than at the state level. For example, the regional demand for all primary care physicians, Cardiologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Urologists, and other surgical specialists was forecast to grow at a slightly higher rate (or contract at a lower rate) than at the state level.

In this scenario, the demand for physicians was forecast to grow by 16 percent in the Northeast region. Demand for primary care physicians was forecast to grow by 15 percent, while demand for non-primary care physicians was forecast to grow by 16 percent. Even though these forecast growth rates were higher than the statewide rate of growth, due to the high rate of population growth predicted for the region (9 percent), demand expressed as a physician to population ratio was forecast to grow at about the same pace (6 percent). However, the regional demand for Psychiatrists, Radiologists, and Ophthalmologists was forecast to grow at a higher rate than at the state level. At the same time, the regional demand for Pathologists, Otolaryngologists, and Urologists was forecast to grow at a lower rate (or decline at an even greater rate) than at the state level.

Figure 132 – Lansing Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,523**	**330**	**1,718**	**356**	**13%**	**8%**
Primary Care	*629*	*136*	*706*	*146*	*12%*	*7%*
General/Family Medicine	334	72	378	78	13%	8%
General Internal Medicine	181	39	215	45	19%	14%
General Pediatrics	114	25	113	23	-1%	-5%
Non-Primary Care	*894*	*194*	*1,012*	*210*	*13%*	*8%*
Cardiovascular Diseases	43	9	56	12	30%	24%
Other Internal Medicine Subspecialties	119	26	142	29	19%	14%
Obstetrics and Gynecology	86	19	83	17	-3%	-7%
Pathology	23	5	26	5	13%	8%
Psychiatry	95	21	101	21	6%	2%
Anesthesiology	61	13	71	15	17%	12%
Radiology	54	12	64	13	17%	12%
Emergency Medicine	98	21	102	21	4%	-1%
General Surgery	68	15	80	17	18%	13%
Ophthalmology	27	6	34	7	25%	19%
Otolaryngology	11	2	12	2	6%	2%
Orthopedic Surgery	35	7	40	8	15%	10%
Urology	15	3	18	4	25%	19%
Other Surgical Specialties	24	5	29	6	19%	14%
		Projected Regional Population Change 2005-2020:				*5%*

Figure 133 – Northeast Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**243**	**170**	**282**	**181**	**16%**	**6%**
Primary Care	*124*	*87*	*144*	*92*	*15%*	*6%*
General/Family Medicine	79	55	92	59	16%	7%
General Internal Medicine	34	24	41	26	21%	11%
General Pediatrics	11	8	10	7	-6%	-14%
Non-Primary Care	*119*	*83*	*138*	*89*	*16%*	*7%*
Cardiovascular Diseases	2	1	3	2	27%	16%
Other Internal Medicine Subspecialties	12	8	15	10	24%	14%
Obstetrics and Gynecology	11	8	11	7	7%	-2%
Pathology	5	4	6	4	13%	4%
Psychiatry	4	3	5	3	16%	6%
Anesthesiology	12	8	15	9	21%	11%
Radiology	9	6	10	7	20%	11%
Emergency Medicine	18	12	19	12	6%	-3%
General Surgery	18	12	21	14	20%	10%
Ophthalmology	2	1	3	2	24%	14%
Otolaryngology	1	1	1	1	-1%	-9%
Orthopedic Surgery	13	9	16	10	18%	9%
Urology	4	3	5	3	18%	8%
Other Surgical Specialties	0	0	0	0	--	--
		Projected Regional Population Change 2005-2020:				*9%*

In this scenario, the demand for physicians was forecast to grow by 29 percent in the Northwest region. Demand for primary care physicians was forecast to grow by 27 percent, while demand for non-primary care physicians was forecast to grow by 30 percent. Even though these forecast growth rates were greater than the statewide rate of growth, due to the higher rate of population growth predicted for the region (17 percent), demand expressed as a physician to population ratio was forecast to grow at a much slower pace (10 percent). Further, demand for Pediatricians and Obstetrician/Gynecologists was forecast to grow more slowly than the forecast rate of population growth in the region, resulting in a decline in the demand for these specialties expressed as a physician to population ratio. However, even after accounting for the forecast population growth, in many specialties, especially Cardiology, other Internal Medicine Subspecialties, Pathology, Orthopedic Surgery, and Otolaryngology, demand was forecast to grow substantially over the forecast period at rates higher than forecast at the state level.

Figure 134 – Northwest Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**853**	**286**	**1,099**	**314**	**29%**	**10%**
Primary Care	*341*	*114*	*433*	*124*	*27%*	*8%*
General/Family Medicine	204	68	261	75	28%	9%
General Internal Medicine	103	35	139	40	35%	15%
General Pediatrics	33	11	33	10	-1%	-15%
Non-Primary Care	*512*	*172*	*666*	*190*	*30%*	*11%*
Cardiovascular Diseases	23	8	32	9	41%	20%
Other Internal Medicine Subspecialties	56	19	77	22	38%	17%
Obstetrics and Gynecology	41	14	46	13	12%	-5%
Pathology	21	7	29	8	37%	17%
Psychiatry	36	12	44	12	22%	4%
Anesthesiology	49	17	64	18	31%	12%
Radiology	37	12	50	14	35%	15%
Emergency Medicine	50	17	59	17	18%	1%
General Surgery	47	16	63	18	34%	14%
Ophthalmology	25	8	34	10	36%	16%
Otolaryngology	10	3	14	4	38%	18%
Orthopedic Surgery	33	11	45	13	35%	15%
Urology	11	4	15	4	31%	12%
Other Surgical Specialties	19	6	26	7	35%	15%
		Projected Regional Population Change 2005-2020:				*17%*

In this scenario, the demand for physicians was forecast to grow by 10 percent in the Saginaw-Thumb region. Demand for primary care physicians was forecast to grow by 9 percent, while demand for non-primary care physicians was forecast to grow by 10 percent. Even though these forecast growth rates were slightly lower than the statewide rate of growth, due to the lower rate of population growth predicted for the region (1 percent), demand expressed as a physician to population ratio was forecast to grow at a faster pace (9 percent) than at the state level. Further, after accounting for the forecast population growth, in a number of specialties, especially General Internal Medicine, Cardiology, Radiology, Ophthalmology, Orthopedic Surgery, and Urology, and other surgical specialties, demand was forecast to grow at rates higher than forecast at the state level.

Figure 135 – Saginaw-Thumb Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,534**	**242**	**1,687**	**264**	**10%**	**9%**
Primary Care	*654*	*103*	*715*	*112*	*9%*	*8%*
General/Family Medicine	412	65	450	70	9%	8%
General Internal Medicine	183	29	211	33	15%	14%
General Pediatrics	60	9	53	8	-10%	-11%
Non-Primary Care	*880*	*139*	*972*	*152*	*10%*	*9%*
Cardiovascular Diseases	44	7	54	8	22%	21%
Other Internal Medicine Subspecialties	98	15	113	18	16%	14%
Obstetrics and Gynecology	78	12	75	12	-4%	-5%
Pathology	24	4	27	4	10%	9%
Psychiatry	48	8	50	8	4%	3%
Anesthesiology	70	11	79	12	13%	12%
Radiology	79	12	91	14	15%	13%
Emergency Medicine	107	17	107	17	1%	0%
General Surgery	82	13	93	14	14%	12%
Ophthalmology	36	6	44	7	20%	19%
Otolaryngology	20	3	21	3	5%	4%
Orthopedic Surgery	49	8	55	9	13%	12%
Urology	23	4	27	4	17%	16%
Other Surgical Specialties	24	4	28	4	17%	16%
			Projected Regional Population Change 2005-2020:			*1%*

In this scenario, the demand for physicians was forecast to grow by 5 percent in the Southwest Michigan region. Demand for primary care physicians was forecast to grow by 5 percent, while demand for non-primary care physicians was forecast to grow by 6 percent. After accounting for the projected population change in the region (1 percent decline), the region was forecast to experience a similar rate of demand growth relative to the state as a whole. This was especially the case in the forecasts of primary care demand. Some notable exceptions included that the regional demand for several specialties (including Cardiology, Otolaryngology, and Urology) was forecast to grow at a lower rate than at the state level.

In this scenario, the demand for physicians was forecast to grow by 8 percent in the Upper Peninsula region. Demand for primary care physicians was forecast to grow by 6 percent, while demand for non-primary care physicians was forecast to grow by 10 percent. After accounting for the projected population change in the region (1 percent decline), the region was forecast to experience a greater rate of demand growth relative to the state as a whole. Regional demand for General Internists, Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Otolaryngologists, Orthopedic Surgeons, Urologists, and other surgical specialists was forecast to grow at rates exceeding those at the state level. Demand for Pediatricians and Obstetricians/Gynecologists was forecast to decline at rates exceeding those at the state level as well.

Figure 136 – Southwest Michigan Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**397**	**136**	**418**	**144**	**5%**	**6%**
Primary Care	*188*	*64*	*197*	*68*	*5%*	*5%*
General/Family Medicine	107	37	113	39	5%	5%
General Internal Medicine	56	19	61	21	9%	10%
General Pediatrics	25	8	23	8	-7%	-6%
Non-Primary Care	*209*	*72*	*221*	*76*	*6%*	*7%*
Cardiovascular Diseases	14	5	15	5	10%	11%
Other Internal Medicine Subspecialties	32	11	36	12	11%	11%
Obstetrics and Gynecology	25	9	24	8	-5%	-5%
Pathology	7	2	7	3	5%	6%
Psychiatry	8	3	8	3	-1%	0%
Anesthesiology	20	7	21	7	8%	9%
Radiology	17	6	19	6	8%	9%
Emergency Medicine	16	5	16	5	-1%	0%
General Surgery	25	9	27	9	9%	10%
Ophthalmology	8	3	9	3	11%	11%
Otolaryngology	5	2	5	2	-1%	-1%
Orthopedic Surgery	8	3	9	3	8%	9%
Urology	5	2	6	2	8%	9%
Other Surgical Specialties	6	2	7	2	12%	12%
			Projected Regional Population Change 2005-2020:			*-1%*

Figure 137 – Upper Peninsula Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**700**	**223**	**757**	**244**	**8%**	**9%**
Primary Care	*336*	*107*	*358*	*115*	*6%*	*7%*
General/Family Medicine	239	76	256	82	7%	8%
General Internal Medicine	65	21	74	24	13%	14%
General Pediatrics	31	10	27	9	-13%	-12%
Non-Primary Care	*364*	*116*	*400*	*129*	*10%*	*11%*
Cardiovascular Diseases	12	4	15	5	23%	24%
Other Internal Medicine Subspecialties	53	17	61	20	16%	17%
Obstetrics and Gynecology	34	11	31	10	-7%	-7%
Pathology	16	5	18	6	10%	11%
Psychiatry	26	8	26	8	2%	3%
Anesthesiology	22	7	25	8	12%	13%
Radiology	30	9	34	11	13%	14%
Emergency Medicine	31	10	31	10	2%	3%
General Surgery	39	12	44	14	14%	15%
Ophthalmology	16	5	18	6	14%	15%
Otolaryngology	9	3	10	3	13%	14%
Orthopedic Surgery	17	5	19	6	11%	12%
Urology	7	2	9	3	25%	27%
Other Surgical Specialties	8	3	9	3	16%	17%
			Projected Regional Population Change 2005-2020:			*-1%*

Figure 138 – West Central Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**481**	**123**	**554**	**131**	**15%**	**6%**
Primary Care	*247*	*63*	*284*	*67*	*15%*	*6%*
General/Family Medicine	168	43	193	45	15%	6%
General Internal Medicine	60	15	72	17	20%	11%
General Pediatrics	19	5	19	4	-1%	-8%
Non-Primary Care	*234*	*60*	*270*	*64*	*16%*	*6%*
Cardiovascular Diseases	11	3	14	3	29%	19%
Other Internal Medicine Subspecialties	26	7	31	7	21%	12%
Obstetrics and Gynecology	30	8	31	7	4%	-4%
Pathology	8	2	10	2	17%	8%
Psychiatry	11	3	13	3	14%	5%
Anesthesiology	13	3	15	4	19%	10%
Radiology	20	5	24	6	20%	10%
Emergency Medicine	25	6	27	6	8%	0%
General Surgery	33	8	39	9	18%	9%
Ophthalmology	6	2	7	2	20%	10%
Otolaryngology	3	1	3	1	13%	4%
Orthopedic Surgery	16	4	19	4	15%	6%
Urology	5	1	6	1	16%	7%
Other Surgical Specialties	1	0	1	0	16%	7%
			Projected Regional Population Change 2005-2020:			*9%*

In this scenario, the demand for physicians was forecast to grow by 15 percent in the West Central region. Demand for primary care physicians was forecast to grow by 15 percent, while demand for non-primary care physicians was forecast to grow by 16 percent. Even though these forecast growth rates were higher than the statewide rate of growth, due to the high rate of population growth predicted for the region (9 percent), demand expressed as a physician to population ratio was forecast to grow at about the same pace (6 percent). In nearly all specialties, the growth in the physician to population ratio was forecast to increase at about the same pace in the region as it was at the state level. Notable exceptions included that regional demand for Cardiologists, Urologists, and other surgical specialists was forecast to grow at a slower rate than at the state level. On the other hand, regional demand for Psychiatrists was forecast to grow at a faster rate than at the state level.

Regional Demand Scenario 2: Trend Scenario

As presented above, the trend scenario attempted to show the effect of increased economic prosperity on the demand for physicians over time. In general, the forecasts in this scenario showed significant growth in demand across almost all specialties in almost all regions. Since the elasticity between increased economic prosperity and demand for physicians is lower for primary care specialties compared to non-primary care specialties, across all regions, the trend scenario showed more extreme growth in non-primary care specialties relative to the demographic only baseline demand forecasts presented in the last section.

In this scenario, the demand for physicians was forecast to grow by 45 percent in the Ann Arbor Area region. Demand for primary care physicians was forecast to grow by 36 percent, while demand for non-primary care physicians was forecast to grow by 49 percent. Even though these

forecast growth rates were greater than the statewide rate of growth, due to the higher rate of population growth predicted for the region (17 percent), demand expressed as a physician to population ratio was forecast to grow at a slower pace (25 percent). Further, in all specialties except Obstetrics and Gynecology and Otolaryngology regional demand was forecast to grow more quickly than the forecast rate of growth for the state as a whole. In particular, demand for Cardiologists, Ophthalmologists, and Urologists, demand was forecast to grow substantially (in excess of 35 percent) over the forecast period.

Figure 139 – Ann Arbor Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**3,546**	**672**	**5,158**	**837**	**45%**	**25%**
Primary Care	*988*	*187*	*1,344*	*218*	*36%*	*16%*
General/Family Medicine	234	44	317	51	35%	16%
General Internal Medicine	543	103	782	127	44%	23%
General Pediatrics	211	40	245	40	16%	0%
Non-Primary Care	*2,557*	*485*	*3,814*	*619*	*49%*	*28%*
Cardiovascular Diseases	89	17	152	25	70%	45%
Other Internal Medicine Subspecialties	532	101	829	135	56%	33%
Obstetrics and Gynecology	154	29	198	32	29%	10%
Pathology	117	22	173	28	48%	26%
Psychiatry	221	42	304	49	38%	18%
Anesthesiology	183	35	278	45	52%	30%
Radiology	160	30	246	40	54%	32%
Emergency Medicine	149	28	202	33	36%	16%
General Surgery	182	34	280	45	54%	32%
Ophthalmology	66	12	106	17	61%	38%
Otolaryngology	45	8	61	10	36%	17%
Orthopedic Surgery	88	17	130	21	48%	27%
Urology	50	9	80	13	60%	37%
Other Surgical Specialties	93	18	141	23	51%	30%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 140 – Detroit Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**14,632**	**342**	**17,377**	**400**	**19%**	**17%**
Primary Care	*5,518*	*129*	*6,228*	*143*	*13%*	*11%*
General/Family Medicine	1,934	45	2,200	51	14%	12%
General Internal Medicine	2,579	60	3,023	70	17%	15%
General Pediatrics	1,006	24	1,005	23	0%	-2%
Non-Primary Care	*9,114*	*213*	*11,149*	*257*	*22%*	*20%*
Cardiovascular Diseases	369	9	483	11	31%	29%
Other Internal Medicine Subspecialties	1,489	35	1,874	43	26%	24%
Obstetrics and Gynecology	886	21	1,000	23	13%	11%
Pathology	374	9	457	11	22%	21%
Psychiatry	657	15	773	18	18%	16%
Anesthesiology	574	13	711	16	24%	22%
Radiology	686	16	852	20	24%	22%
Emergency Medicine	750	18	874	20	17%	15%
General Surgery	802	19	1,005	23	25%	23%
Ophthalmology	348	8	443	10	27%	25%
Otolaryngology	141	3	168	4	19%	17%
Orthopedic Surgery	358	8	440	10	23%	21%
Urology	181	4	232	5	29%	27%
Other Surgical Specialties	266	6	333	8	25%	23%
			Projected Regional Population Change 2005-2020:			*2%*

Figure 141 – East Central Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**151**	**100**	**193**	**117**	**28%**	**17%**
Primary Care	*88*	*59*	*110*	*67*	*25%*	*14%*
General/Family Medicine	55	37	69	42	25%	14%
General Internal Medicine	26	18	34	21	29%	18%
General Pediatrics	7	4	7	4	1%	-8%
Non-Primary Care	*63*	*42*	*83*	*50*	*32%*	*21%*
Cardiovascular Diseases	1	1	2	1	46%	33%
Other Internal Medicine Subspecialties	12	8	17	10	42%	30%
Obstetrics and Gynecology	9	6	10	6	15%	5%
Pathology	3	2	4	2	30%	19%
Psychiatry	2	1	3	2	33%	22%
Anesthesiology	2	1	3	2	37%	25%
Radiology	1	1	1	1	37%	25%
Emergency Medicine	11	7	14	8	30%	18%
General Surgery	11	7	15	9	37%	25%
Ophthalmology	2	1	3	2	39%	27%
Otolaryngology	4	3	5	3	14%	4%
Orthopedic Surgery	0	0	0	0	--	--
Urology	1	1	1	1	36%	24%
Other Surgical Specialties	1	1	2	1	45%	32%
			Projected Regional Population Change 2005-2020:			*9%*

In this scenario, the demand for physicians was forecast to grow by 19 percent in the Detroit Area region. Demand for primary care physicians was forecast to grow by 13 percent, while demand for non-primary care physicians was forecast to grow by 22 percent. Because these

forecast growth rates were lower than the statewide rate of growth and due to the low rate of population growth predicted for the region (2 percent), demand expressed as a physician to population ratio was forecast to grow at a slower rate than at the state level. In nearly all specialties, the growth in the physician to population ratio was forecast to increase at a slower rate in the region as it was at the state level.

In this scenario, the demand for physicians was forecast to grow by 28 percent in the East Central region. Demand for primary care physicians was forecast to grow by 25 percent, while demand for non-primary care physicians was forecast to grow by 32 percent. Even though these forecast growth rates were slightly greater than the statewide rate of growth, due to the rate of population growth predicted for the region (9 percent), demand expressed as a physician to population ratio was forecast to grow at a slower rate than at the state level. With several exceptions (Obstetrics and Gynecology, Pathology, Otolaryngology, and Urology) specialty-specific regional demand was forecast to grow at about the same pace as it was at the state level.

In this scenario, the demand for physicians was forecast to grow by 15 percent in the Flint Area region. Demand for primary care physicians was forecast to grow by 11 percent, while demand for non-primary care physicians was forecast to grow by 20 percent. Even though these forecast growth rates were substantially lower than the statewide rate of growth, due to the rate of population decline predicted for the region (2 percent), demand expressed as a physician to population ratio was forecast to grow at a relatively similar pace (17 percent). Moreover, specialty-specific regional demand forecasts were also similar to those at the state level. However, regional demand for Otolaryngologists was forecast to grow at a rate lower than at the state level.

Figure 142 – Flint Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,425**	**276**	**1,642**	**324**	**15%**	**17%**
Primary Care	*748*	*145*	*829*	*163*	*11%*	*13%*
General/Family Medicine	376	73	415	82	11%	13%
General Internal Medicine	286	55	327	65	14%	17%
General Pediatrics	86	17	86	17	-1%	1%
Non-Primary Care	*676*	*131*	*814*	*160*	*20%*	*23%*
Cardiovascular Diseases	27	5	35	7	30%	32%
Other Internal Medicine Subspecialties	121	23	149	29	23%	25%
Obstetrics and Gynecology	79	15	87	17	9%	11%
Pathology	25	5	30	6	21%	23%
Psychiatry	34	7	40	8	16%	18%
Anesthesiology	47	9	57	11	22%	25%
Radiology	79	15	98	19	23%	25%
Emergency Medicine	48	9	55	11	14%	17%
General Surgery	63	12	77	15	23%	25%
Ophthalmology	19	4	24	5	28%	31%
Otolaryngology	12	2	14	3	14%	16%
Orthopedic Surgery	34	6	41	8	22%	24%
Urology	10	2	13	3	26%	28%
Other Surgical Specialties	22	4	28	5	25%	27%
		Projected Regional Population Change 2005-2020:				*-2%*

Figure 143 – Grand Rapids-Muskegon Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**2,756**	**233**	**3,682**	**272**	**34%**	**17%**
Primary Care	*1,053*	*89*	*1,333*	*98*	*27%*	*11%*
General/Family Medicine	547	46	696	51	27%	11%
General Internal Medicine	333	28	440	32	32%	15%
General Pediatrics	173	15	197	15	14%	-1%
Non-Primary Care	*1,702*	*144*	*2,350*	*173*	*38%*	*21%*
Cardiovascular Diseases	45	4	66	5	49%	30%
Other Internal Medicine Subspecialties	221	19	314	23	42%	24%
Obstetrics and Gynecology	180	15	229	17	27%	11%
Pathology	54	5	75	6	39%	21%
Psychiatry	85	7	114	8	35%	18%
Anesthesiology	157	13	220	16	40%	22%
Radiology	129	11	181	13	41%	23%
Emergency Medicine	195	16	257	19	32%	15%
General Surgery	165	14	233	17	41%	23%
Ophthalmology	64	5	91	7	43%	25%
Otolaryngology	30	3	42	3	38%	20%
Orthopedic Surgery	116	10	160	12	38%	21%
Urology	38	3	54	4	44%	26%
Other Surgical Specialties	70	6	101	7	43%	25%
			Projected Regional Population Change 2005-2020:			*14%*

Figure 144 – Jackson Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**605**	**130**	**752**	**156**	**24%**	**20%**
Primary Care	*253*	*54*	*296*	*61*	*17%*	*13%*
General/Family Medicine	135	29	159	33	18%	13%
General Internal Medicine	79	17	98	20	24%	20%
General Pediatrics	39	8	39	8	0%	-3%
Non-Primary Care	*352*	*76*	*456*	*95*	*30%*	*25%*
Cardiovascular Diseases	17	4	25	5	44%	39%
Other Internal Medicine Subspecialties	54	12	74	15	37%	32%
Obstetrics and Gynecology	29	6	33	7	15%	11%
Pathology	12	3	16	3	32%	28%
Psychiatry	31	7	38	8	23%	19%
Anesthesiology	30	6	39	8	32%	27%
Radiology	22	5	29	6	32%	27%
Emergency Medicine	31	7	37	8	20%	16%
General Surgery	32	7	42	9	32%	27%
Ophthalmology	18	4	25	5	36%	31%
Otolaryngology	10	2	13	3	24%	20%
Orthopedic Surgery	17	4	22	5	30%	26%
Urology	7	2	10	2	36%	31%
Other Surgical Specialties	4	1	5	1	33%	28%
			Projected Regional Population Change 2005-2020:			*4%*

In this scenario, the demand for physicians was forecast to grow by 34 percent in the Grand Rapids-Muskegon Area region. Demand for primary care physicians was forecast to grow by 27 percent, while demand for non-primary care physicians was forecast to grow by 38 percent. Even though these forecast growth rates were higher than the statewide rate of growth, due to the high rate of population growth predicted for the region (14 percent), demand expressed as a physician to population ratio was forecast to grow at a slightly slower pace (17 percent) than the state as a whole. For the most part, the growth in demand expressed as a physician to population ratio was forecast to increase at a slightly slower pace in the region than it was at the state level. This was not the case, however, for Obstetrics and Gynecology, Psychiatry, and Otolaryngology where regional demand was forecast to grow at the same pace as state level demand for physicians in those specialties.

In this scenario, the demand for physicians was forecast to grow by 24 percent in the Jackson Area region. Demand for primary care physicians was forecast to grow by 17 percent, while demand for non-primary care physicians was forecast to grow by 30 percent. Compared to the forecasts at the state level, the region was forecast to have a very similar experience. Some notable exceptions included that the regional demand for Cardiologists, other Internal Medicine subspecialists, and Pathologists expressed as a physician to patient ratio was forecast to grow at a slightly higher rate than at the state level.

Figure 145 – Kalamazoo-Battle Creek Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,521**	**275**	**1,843**	**321**	**21%**	**17%**
Primary Care	*576*	*104*	*663*	*115*	*15%*	*11%*
General/Family Medicine	254	46	294	51	16%	12%
General Internal Medicine	214	39	255	44	19%	15%
General Pediatrics	107	19	114	20	6%	2%
Non-Primary Care	*945*	*171*	*1,180*	*205*	*25%*	*20%*
Cardiovascular Diseases	38	7	51	9	33%	28%
Other Internal Medicine Subspecialties	146	26	188	33	29%	25%
Obstetrics and Gynecology	69	12	79	14	13%	9%
Pathology	27	5	34	6	25%	20%
Psychiatry	99	18	121	21	21%	17%
Anesthesiology	51	9	65	11	26%	21%
Radiology	53	9	67	12	28%	24%
Emergency Medicine	127	23	151	26	19%	14%
General Surgery	83	15	105	18	27%	22%
Ophthalmology	30	5	40	7	31%	26%
Otolaryngology	15	3	20	3	30%	25%
Orthopedic Surgery	60	11	76	13	27%	22%
Urology	17	3	22	4	31%	26%
Other Surgical Specialties	28	5	37	6	29%	24%
			Projected Regional Population Change 2005-2020:			*4%*

In this scenario, the demand for physicians was forecast to grow by 21 percent in the Kalamazoo-Battle Creek region. Demand for primary care physicians was forecast to grow by 15 percent, while demand for non-primary care physicians was forecast to grow by 25 percent. Compared to the forecasts at the state level, demand for physicians in the region expressed as a physician to population ratio was forecast to grow at a somewhat lower rate over the forecast period. The exception was the regional demand for Otolaryngologists, as it was forecast to grow at a higher rate in the region than at the state level.

Figure 146 – Lansing Area Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,523**	**330**	**1,918**	**397**	**26%**	**20%**
Primary Care	*629*	*136*	*754*	*156*	*20%*	*15%*
General/Family Medicine	334	72	404	84	21%	16%
General Internal Medicine	181	39	230	48	27%	22%
General Pediatrics	114	25	121	25	6%	1%
Non-Primary Care	*894*	*194*	*1,164*	*241*	*30%*	*25%*
Cardiovascular Diseases	43	9	65	13	50%	43%
Other Internal Medicine Subspecialties	119	26	163	34	37%	31%
Obstetrics and Gynecology	86	19	96	20	12%	7%
Pathology	23	5	30	6	30%	25%
Psychiatry	95	21	116	24	22%	17%
Anesthesiology	61	13	82	17	34%	28%
Radiology	54	12	73	15	35%	29%
Emergency Medicine	98	21	117	24	19%	14%
General Surgery	68	15	92	19	36%	30%
Ophthalmology	27	6	39	8	43%	37%
Otolaryngology	11	2	13	3	22%	17%
Orthopedic Surgery	35	7	46	9	33%	27%
Urology	15	3	21	4	43%	37%
Other Surgical Specialties	24	5	33	7	37%	31%
		Projected Regional Population Change 2005-2020:				*5%*

In this scenario, the demand for physicians was forecast to grow by 26 percent in the Lansing Area region. Demand for primary care physicians was forecast to grow by 20 percent, while demand for non-primary care physicians was forecast to grow by 30 percent. While the region's population was forecast to grow at about the same rate as the state (20 percent), the demand for physicians a substantial number of specialties was forecast to grow at a more rapid pace than at the state level. For example, the regional demand for all primary care physicians, Cardiologists, Anesthesiologists, Radiologists, General Surgeons, Ophthalmologists, Orthopedic Surgeons, Urologists, and other surgical specialists was forecast to grow at a slightly higher rate (or contract at a lower rate) than at the state level. Regional demand for Otolaryngologists was forecast to grow at a slower rate than at the state level.

In this scenario, the demand for physicians was forecast to grow by 28 percent in the Northeast region. Demand for primary care physicians was forecast to grow by 23 percent, while demand for non-primary care physicians was forecast to grow by 34 percent. Even though these forecast growth rates were higher than the statewide rate of growth, due to the high rate of population growth predicted for the region (9 percent), demand expressed as a physician to population ratio was forecast to grow at a similar pace (18 percent). However, the regional demand for Internal

Medicine subspecialists (aside from Cardiologists) and Psychiatrists was forecast to grow at a higher rate than at the state level. At the same time, the regional demand for Pathologists, Emergency Medicine physicians, Otolaryngologists, and Urologists was forecast to grow at a lower rate than at the state level.

Figure 147 – Northeast Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**243**	**170**	**313**	**201**	**28%**	**18%**
Primary Care	*124*	*87*	*153*	*98*	*23%*	*13%*
General/Family Medicine	79	55	98	63	24%	14%
General Internal Medicine	34	24	44	28	29%	18%
General Pediatrics	11	8	11	7	1%	-8%
Non-Primary Care	*119*	*83*	*159*	*102*	*34%*	*23%*
Cardiovascular Diseases	2	1	3	2	46%	34%
Other Internal Medicine Subspecialties	12	8	17	11	43%	31%
Obstetrics and Gynecology	11	8	13	8	22%	12%
Pathology	5	4	7	4	30%	19%
Psychiatry	4	3	6	4	33%	22%
Anesthesiology	12	8	17	11	39%	28%
Radiology	9	6	12	8	39%	27%
Emergency Medicine	18	12	22	14	22%	12%
General Surgery	18	12	24	16	38%	27%
Ophthalmology	2	1	3	2	42%	31%
Otolaryngology	1	1	1	1	14%	4%
Orthopedic Surgery	13	9	18	12	36%	25%
Urology	4	3	6	4	36%	25%
Other Surgical Specialties	0	0	0	0	--	--
		Projected Regional Population Change 2005-2020:				*9%*

In this scenario, the demand for physicians was forecast to grow by 44 percent in the Northwest region. Demand for primary care physicians was forecast to grow by 36 percent, while demand for non-primary care physicians was forecast to grow by 50 percent. Even though these forecast growth rates were greater than the statewide rate of growth, due to the higher rate of population growth predicted for the region (17 percent), demand expressed as a physician to population ratio was forecast to grow at a much slower pace (23 percent). Moreover, after accounting for the forecast population growth, in a number of specialties, including, Pathology and Otolaryngology, demand was forecast to grow at rates in excess of 10 percent higher than forecast at the state level. Finally, demand for Pediatricians and was forecast to decline more quickly than the forecast rate at the state level

Figure 148 – Northwest Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**853**	**286**	**1,229**	**351**	**44%**	**23%**
Primary Care	*341*	*114*	*463*	*132*	*36%*	*16%*
General/Family Medicine	204	68	279	80	36%	16%
General Internal Medicine	103	35	149	42	44%	23%
General Pediatrics	33	11	36	10	6%	-10%
Non-Primary Care	*512*	*172*	*766*	*219*	*50%*	*28%*
Cardiovascular Diseases	23	8	37	11	62%	38%
Other Internal Medicine Subspecialties	56	19	88	25	58%	35%
Obstetrics and Gynecology	41	14	53	15	28%	9%
Pathology	21	7	33	10	57%	34%
Psychiatry	36	12	50	14	40%	20%
Anesthesiology	49	17	74	21	51%	28%
Radiology	37	12	57	16	55%	32%
Emergency Medicine	50	17	68	19	36%	16%
General Surgery	47	16	73	21	54%	31%
Ophthalmology	25	8	40	11	57%	33%
Otolaryngology	10	3	16	5	59%	36%
Orthopedic Surgery	33	11	51	15	55%	32%
Urology	11	4	17	5	51%	29%
Other Surgical Specialties	19	6	30	9	56%	33%
			Projected Regional Population Change 2005-2020:			*17%*

Figure 149 – Saginaw-Thumb Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**1,534**	**242**	**1,881**	**294**	**23%**	**21%**
Primary Care	*654*	*103*	*763*	*119*	*17%*	*16%*
General/Family Medicine	412	65	481	75	17%	16%
General Internal Medicine	183	29	225	35	23%	22%
General Pediatrics	60	9	57	9	-4%	-5%
Non-Primary Care	*880*	*139*	*1,118*	*175*	*27%*	*26%*
Cardiovascular Diseases	44	7	62	10	41%	39%
Other Internal Medicine Subspecialties	98	15	130	20	33%	32%
Obstetrics and Gynecology	78	12	87	14	11%	10%
Pathology	24	4	31	5	27%	26%
Psychiatry	48	8	57	9	19%	18%
Anesthesiology	70	11	91	14	30%	28%
Radiology	79	12	104	16	32%	31%
Emergency Medicine	107	17	123	19	16%	15%
General Surgery	82	13	107	17	31%	29%
Ophthalmology	36	6	50	8	38%	37%
Otolaryngology	20	3	25	4	21%	20%
Orthopedic Surgery	49	8	64	10	30%	29%
Urology	23	4	31	5	35%	34%
Other Surgical Specialties	24	4	33	5	34%	33%
			Projected Regional Population Change 2005-2020:			*1%*

In this scenario, the demand for physicians was forecast to grow by 23 percent in the Saginaw-Thumb region. Demand for primary care physicians was forecast to grow by 17 percent, while demand for non-primary care physicians was forecast to grow by 27 percent. Even though these forecast growth rates were slightly lower than the statewide rate of growth, due to the lower rate of population growth predicted for the region (1 percent), demand expressed as a physician to population ratio was forecast to grow at a slightly faster pace (21 percent) than at the state level. Further, after accounting for the forecast population growth, in a number of specialties, including, Family Medicine, General Internal Medicine, Cardiology, Radiology, Ophthalmology, Orthopedic Surgery, and Urology, and other surgical specialties, demand was forecast to grow at rates higher than forecast at the state level.

In this scenario, the demand for physicians was forecast to grow by 17 percent in the Southwest Michigan region. Demand for primary care physicians was forecast to grow by 12 percent, while demand for non-primary care physicians was forecast to grow by 22 percent. After accounting for the projected population change in the region (1 percent decline), the region was forecast to experience a similar rate of demand growth relative to the state as a whole. This was especially the case in the forecasts of primary care demand. Some notable exceptions included that the regional demand for several specialties (including Cardiology, Psychiatry, Otolaryngology, and Urology) was forecast to grow at a lower rate than at the state level.

Figure 150 – Southwest Michigan Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**397**	**136**	**465**	**160**	**17%**	**18%**
Primary Care	*188*	*64*	*210*	*72*	*12%*	*12%*
General/Family Medicine	107	37	120	41	12%	13%
General Internal Medicine	56	19	65	23	16%	17%
General Pediatrics	25	8	25	8	-1%	0%
Non-Primary Care	*209*	*72*	*254*	*88*	*22%*	*23%*
Cardiovascular Diseases	14	5	18	6	26%	27%
Other Internal Medicine Subspecialties	32	11	41	14	27%	28%
Obstetrics and Gynecology	25	9	28	10	9%	10%
Pathology	7	2	8	3	21%	22%
Psychiatry	8	3	9	3	14%	15%
Anesthesiology	20	7	24	8	24%	25%
Radiology	17	6	22	7	25%	26%
Emergency Medicine	16	5	18	6	14%	15%
General Surgery	25	9	31	11	25%	26%
Ophthalmology	8	3	10	3	27%	28%
Otolaryngology	5	2	6	2	14%	14%
Orthopedic Surgery	8	3	10	4	24%	25%
Urology	5	2	6	2	25%	25%
Other Surgical Specialties	6	2	8	3	29%	29%
			Projected Regional Population Change 2005-2020:			*-1%*

In this scenario, the demand for physicians was forecast to grow by 20 percent in the Upper Peninsula region. Demand for primary care physicians was forecast to grow by 14 percent, while demand for non-primary care physicians was forecast to grow by 26 percent. After accounting for the projected population change in the region (1 percent decline), the region was forecast to experience a greater rate of demand growth relative to the state as a whole. Regional demand for General Internists, Cardiologists, other Internal Medicine Subspecialists, Pathologists, Anesthesiologists, Radiologists, General Surgeons, Otolaryngologists, Orthopedic Surgeons, Urologists, and other surgical specialists was forecast to grow at rates exceeding those at the state level. Demand for Pediatricians was forecast to decline at rates exceeding those at the state level as well.

Figure 151 – Upper Peninsula Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**700**	**223**	**841**	**271**	**20%**	**21%**
Primary Care	*336*	*107*	*382*	*123*	*14%*	*15%*
General/Family Medicine	239	76	274	88	14%	15%
General Internal Medicine	65	21	79	25	21%	22%
General Pediatrics	31	10	29	9	-7%	-6%
Non-Primary Care	*364*	*116*	*460*	*148*	*26%*	*27%*
Cardiovascular Diseases	12	4	17	5	41%	43%
Other Internal Medicine Subspecialties	53	17	70	22	33%	34%
Obstetrics and Gynecology	34	11	36	12	6%	7%
Pathology	16	5	20	7	27%	28%
Psychiatry	26	8	30	10	17%	19%
Anesthesiology	22	7	28	9	29%	30%
Radiology	30	9	39	12	29%	31%
Emergency Medicine	31	10	36	12	17%	18%
General Surgery	39	12	51	16	31%	33%
Ophthalmology	16	5	21	7	31%	32%
Otolaryngology	9	3	12	4	30%	31%
Orthopedic Surgery	17	5	22	7	27%	29%
Urology	7	2	10	3	44%	46%
Other Surgical Specialties	8	3	11	3	34%	35%
			Projected Regional Population Change 2005-2020:			*-1%*

In this scenario, the demand for physicians was forecast to grow by 28 percent in the West Central region. Demand for primary care physicians was forecast to grow by 23 percent, while demand for non-primary care physicians was forecast to grow by 33 percent. Even though these forecast growth rates were higher than the statewide rate of growth, due to the high rate of population growth predicted for the region (9 percent), demand expressed as a physician to population ratio was forecast to grow at a similar pace. In nearly all specialties, the growth in the physician to population ratio was forecast to increase at about the same pace in the region as it was at the state level. Notable exceptions included that regional demand for Cardiologists, Urologists, and other surgical specialists was forecast to grow at a slower rate than at the state level. On the other hand, regional demand for Psychiatrists was forecast to grow at a faster rate than at the state level.

Figure 152 – West Central Regional Physician Demand Forecast, 2005-2020

	2005		2020		Change 2005-2020	
	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population	Physicians	Per 100,000 Population
All Physicians	**481**	**123**	**613**	**145**	**28%**	**18%**
Primary Care	*247*	*63*	*303*	*71*	*23%*	*13%*
General/Family Medicine	168	43	206	49	22%	13%
General Internal Medicine	60	15	77	18	28%	18%
General Pediatrics	19	5	20	5	6%	-2%
Non-Primary Care	*234*	*60*	*311*	*73*	*33%*	*22%*
Cardiovascular Diseases	11	3	17	4	49%	37%
Other Internal Medicine Subspecialties	26	7	36	8	39%	28%
Obstetrics and Gynecology	30	8	36	9	20%	10%
Pathology	8	2	11	3	35%	24%
Psychiatry	11	3	15	4	31%	21%
Anesthesiology	13	3	17	4	37%	26%
Radiology	20	5	27	6	38%	27%
Emergency Medicine	25	6	32	7	25%	15%
General Surgery	33	8	45	11	36%	26%
Ophthalmology	6	2	8	2	38%	27%
Otolaryngology	3	1	4	1	30%	20%
Orthopedic Surgery	16	4	21	5	32%	22%
Urology	5	1	7	2	34%	23%
Other Surgical Specialties	1	0	1	0	34%	23%
			Projected Regional Population Change 2005-2020:			*9%*

Chapter 9: Relationship between Physician Supply and Demand in Michigan 2020

In order to clearly indicate the relationship between the projected physician supply and demand in Michigan in 2020, in this section, the results of the supply and demand projections are compared in a side-by-side fashion. For each of the four supply scenarios, the projected state-level shortage or surplus of physicians is presented in the aggregate and by specialty for each demand scenario and under both insurance environments.[9]

State Level Supply Scenario 1: Baseline

In the aggregate, physician demand was projected to grow at a faster pace than the baseline physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 425 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 4,444 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 12 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 10 percent, demand was forecast to decline by 19 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 36 percent (Demographic) and 22 percent (Trend) in 2020.

Figure 153 – Projected Difference Between Physician Supply and Demand in Michigan in 2020

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
All Physicians	-425	-1%	-4,444	-12%	8,894	36%	5,980	22%
Full Insurance Environment								
All Physicians	-2,064	-6%	-6,286	-16%	7,706	30%	4,645	16%

[9] In the full insurance environment, shortages forecast in the Demographic Only and Trend Scenarios were greater than in the constant insurance environment, while surpluses forecast in the Reduction of Unnecessary Services Scenarios were smaller than in the constant insurance environment. For the purposes of keeping this document manageable, only the constant insurance environment is interpreted in detail.

Primary Care in Aggregate

In the aggregate, primary care physician demand was projected to grow at a faster pace than the baseline primary care physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline primary care physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 65 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to about 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 941 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 10 percent, demand was forecast to decline by20 percent (Demographic) and 15 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 37 percent (Demographic) and 29 percent (Trend) in 2020.

Non-Primary Care in Aggregate

In the aggregate, non-primary care physician demand was projected to grow at a faster pace than the baseline non-primary care physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline non-primary care physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 360 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to about 2 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 3,503 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 15 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 10 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 36 percent (Demographic) and 18 percent (Trend) in 2020.

Figure 154 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care and Non-Primary Care Specialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care	-65	-1%	-941	-7%	3,497	37%	2,862	29%
Non-Primary Care	-360	-2%	-3,503	-15%	5,397	36%	3,118	18%
Full Insurance Environment								
Primary Care	-589	-4%	-1,500	-10%	3,118	32%	2,457	24%
Non-Primary Care	-1,475	-7%	-4,785	-19%	4,589	29%	2,188	12%

Specialty-Specific Supply and Demand Relationships

In the Demographic Only Scenario, demand was forecast to grow at a faster rate than supply in General/Family Medicine, Cardiology, Pathology, Psychiatry, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other Surgical Subspecialties. Thus, in these specialties, the Demographic Only Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, General Surgery, Ophthalmology, Urology, and other Surgical Subspecialties where the difference between physician supply and demand was forecast to be at least 10 percent of the forecast demand for physicians in those specialties.

In the Trend Scenario, demand was forecast to grow at a faster rate than supply in all specialties except Emergency Medicine. Thus, in all specialties, except Emergency Medicine, the Trend Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, General Surgery, Ophthalmology, Orthopedic Surgery, Urology, and other Surgical Subspecialties where the difference between physician supply and demand was forecast to be at least 20 percent of the forecast demand for physicians in those specialties.

In the Reduction of Unnecessary Services scenarios, supply was forecast to grow at a faster rate than demand in all specialties except Cardiology (Trend), Pathology (Trend), and Ophthalmology (Trend in Full Insurance Environment). Thus, in the vast majority of specialties, this scenario suggested that if all unnecessary services were eliminated, a surplus of physicians would exist in 2020. In most cases, the surplus would be in excess of 20 percent.

Primary Care Specialties

General/Family Medicine

General/Family physician demand was projected to grow at a faster pace than the baseline physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline physician supply forecast in the other scenarios.

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 211 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 592 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 10 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 7 percent, demand was forecast to decline by 20 percent (Demographic) and 14 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 33 percent (Demographic) and 24 percent (Trend) in 2020.

General Internal Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 67 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 302 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 5 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 17 percent, demand was forecast to decline by 17 percent (Demographic) and 11 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 40 percent (Demographic) and 31 percent (Trend) in 2020.

General Pediatrics

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 79 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 48 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 2 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 1 percent, demand was forecast to decline by 30 percent (Demographic) and 25 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 44 percent (Demographic) and 35 percent (Trend) in 2020.

Figure 155 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care Specialties Detail

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care (Overall)	-65	-1%	-941	-7%	3,497	37%	2,862	29%
General/Family Medicine	-211	-4%	-592	-10%	1,338	33%	1,061	24%
General Internal Medicine	67	1%	-302	-5%	1,568	40%	1,300	31%
General Pediatrics	79	4%	-48	-2%	591	44%	500	35%
Full Insurance Environment								
Primary Care (Overall)	-589	-4%	-1,500	-10%	3,118	32%	2,457	24%
General/Family Medicine	-403	-7%	-797	-13%	1,198	28%	913	20%
General Internal Medicine	-189	-3%	-576	-9%	1,382	33%	1,102	25%
General Pediatrics	4	0%	-128	-6%	537	38%	442	29%

Non-Primary Care Specialties

Cardiology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 203 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 23 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 338 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 33 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 6 percent, demand was forecast to decline by 12 percent (Demographic) and increase by 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians

required to meet the demand for their services, the predicted difference between supply and demand for Cardiologists in the Reduction of Unnecessary Services scenarios ranged from a 7 percent surplus (Demographic) to a 7 percent shortage (Trend) in 2020.

Other Internal Medicine Subspecialties

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 79 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 2 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 442 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 11 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 20 percent, demand was forecast to decline by 15 percent (Demographic) and 3 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 41 percent (Demographic) and 23 percent (Trend) in 2020.

Obstetrics and Gynecology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 8 percent, or 134 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 8 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 125 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 6 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 9 percent, demand was forecast to decline by 27 percent (Demographic) and 16 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 49 percent (Demographic) and 29 percent (Trend) in 2020.

Pathology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 133 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 16 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 255 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 27 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 6 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 15 percent (Demographic) in 2020.

Figure 156 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Cardiology, Other Internal Medicine Subspecialties, Obstetrics and Gynecology, and Pathology

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Cardiology	-203	-23%	-338	-33%	43	7%	-54	-7%
Other Internal Medicine Subspecialties	79	2%	-442	-11%	1,033	41%	655	23%
Obstetrics and Gynecology	134	8%	-125	-6%	609	49%	421	29%
Pathology	-133	-16%	-255	-27%	89	15%	1	0%
Full Insurance Environment								
Cardiology	-239	-26%	-379	-35%	17	3%	-84	-11%
Other Internal Medicine Subspecialties	-99	-3%	-647	-15%	904	34%	507	17%
Obstetrics and Gynecology	-24	-1%	-307	-14%	494	36%	289	18%
Pathology	-181	-21%	-309	-31%	55	9%	-38	-5%

Psychiatry

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 95 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 313 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 19 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was not forecast to change, demand was forecast to decline by 22 percent (Demographic) and 10 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 29 percent (Demographic) and 12 percent (Trend) in 2020.

Anesthesiology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 23 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 2 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 200 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 12 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 17 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 40 percent (Demographic) and 22 percent (Trend) in 2020.

Radiology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 61 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 298 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 16 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 10 percent, demand was forecast to decline by 17 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 33 percent (Demographic) and 15 percent (Trend) in 2020.

Emergency Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 432 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 25 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 170 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 8 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 31 percent, demand was forecast to decline by 24 percent (Demographic) and 12 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 72 percent (Demographic) and 50 percent (Trend) in 2020.

Figure 157 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Psychiatry, Anesthesiology, Radiology, and Emergency Medicine

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Psychiatry	-95	-7%	-313	-19%	306	29%	147	12%
Anesthesiology	23	2%	-200	-12%	431	40%	270	22%
Radiology	-61	-4%	-298	-16%	371	33%	200	15%
Emergency Medicine	432	25%	170	8%	911	72%	721	50%
Full Insurance Environment								
Psychiatry	-98	-7%	-318	-19%	303	29%	144	12%
Anesthesiology	-55	-4%	-290	-16%	374	33%	204	16%
Radiology	-152	-9%	-402	-21%	305	25%	124	9%
Emergency Medicine	370	21%	100	5%	867	66%	670	45%

General Surgery

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 200 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 11 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 484 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 22 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 3 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 23 percent (Demographic) and 7 percent (Trend) in 2020.

Ophthalmology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 123 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 16 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 241 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 27 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 1 percent, demand was forecast to decline by 15 percent (Demographic) and 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 16 percent (Demographic) and 1 percent (Trend) in 2020.

Otolaryngology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 19 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 5 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 71 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 18 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 3 percent, demand was forecast to decline by 21 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 30 percent (Demographic) and 13 percent (Trend) in 2020.

Orthopedic Surgery

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 86 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 9 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 230 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 21 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 3 percent, demand was forecast to decline by 18 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 26 percent (Demographic) and 9 percent (Trend) in 2020.

Figure 158 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, General Surgery, Ophthalmology, Otolaryngology, and Orthopedic Surgery

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
General Surgery	-200	-11%	-484	-22%	321	23%	115	7%
Ophthalmology	-123	-16%	-241	-27%	93	16%	7	1%
Otolaryngology	-19	-5%	-71	-18%	76	30%	39	13%
Orthopedic Surgery	-86	-9%	-230	-21%	178	26%	73	9%
Full Insurance Environment								
General Surgery	-299	-15%	-599	-26%	249	17%	32	2%
Ophthalmology	-138	-17%	-258	-28%	82	14%	-5	-1%
Otolaryngology	-42	-11%	-97	-23%	60	22%	20	6%
Orthopedic Surgery	-151	-15%	-304	-26%	131	18%	19	2%

Urology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 52 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 12 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 118 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 23 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 5 percent, demand was forecast to decline by 14 percent (Demographic) and 1 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 22 percent (Demographic) and 6 percent (Trend) in 2020.

Other Surgical Subspecialties

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 77 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 12 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 176 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 23 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 3 percent, demand was forecast to decline by 15 percent (Demographic) and 3 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 22 percent (Demographic) and 6 percent (Trend) in 2020.

Figure 159 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Urology and Other Surgical Subspecialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Urology	-52	-12%	-118	-23%	71	22%	22	6%
Other Surgical Subspecialties	-77	-12%	-176	-23%	105	22%	33	6%
Full Insurance Environment								
Urology	-73	-16%	-143	-27%	55	16%	4	1%
Other Surgical Subspecialties	-110	-16%	-214	-27%	81	16%	6	1%

State Level Supply Scenario 2: 5 percent Reduction in Physician Effort

Under this scenario, in the aggregate, physician demand was projected to grow at a faster pace than the baseline physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 2,098 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 6 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 6,117 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 16 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 5 percent, demand was forecast to decline by 19 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 29 percent (Demographic) and 16 percent (Trend) in 2020.

Figure 160 – Projected Difference Between Physician Supply and Demand in Michigan in 2020

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
All Physicians	-2,098	-6%	-6,117	-16%	7,221	29%	4,307	16%
Full Insurance Environment								
All Physicians	-3,737	-11%	-7,959	-20%	6,033	23%	2,972	10%

Primary Care in Aggregate

In the aggregate, primary care physician demand was projected to grow at a faster pace than the baseline primary care physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline primary care physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 710 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 5 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 1,586 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 11 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 4 percent, demand was forecast to decline by 20 percent (Demographic) and 15 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 30 percent (Demographic) and 22 percent (Trend) in 2020.

Non-Primary Care in Aggregate

In the aggregate, non-primary care physician demand was projected to grow at a faster pace than the baseline non-primary care physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline non-primary care physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 1,389 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to about 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 4,532 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 19 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 5 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 29 percent (Demographic) and 12 percent (Trend) in 2020.

Figure 161 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care and Non-Primary Care Specialties

	Demographic Only Scenario		**Trend Scenario**		**Reduction of Unnecessary Services and Demographic Scenario**		**Reduction of Unnecessary Services and Trend Scenario**	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care	-710	-5%	-1,586	-11%	2,853	30%	2,217	22%
Non-Primary Care	-1,389	-7%	-4,532	-19%	4,368	29%	2,089	12%
Full Insurance Environment								
Primary Care	-1,233	-9%	-2,145	-15%	2,473	25%	1,812	17%
Non-Primary Care	-2,503	-11%	-5,814	-23%	3,560	22%	1,160	6%

Specialty-Specific Supply and Demand Relationships

In the Demographic Only Scenario, demand was forecast to grow at a faster rate than supply in all specialties except Obstetrics and Gynecology and Emergency Medicine. Thus, in most specialties, the Demographic Only Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, General Surgery, Ophthalmology, Urology, and other Surgical Subspecialties where the difference between physician supply and demand was forecast to be at least 15 percent of the forecast demand for physicians in those specialties.

In the Trend Scenario, demand was forecast to grow at a faster rate than supply in all specialties except Emergency Medicine. Thus, in all specialties, except Emergency Medicine, the Trend Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, Psychiatry, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other

Surgical Subspecialties where the difference between physician supply and demand was forecast to be at least 20 percent of the forecast demand for physicians in those specialties.

In the Reduction of Unnecessary Services scenarios, supply was forecast to grow at a faster rate than demand in all specialties except Cardiology (Demographic and Trend), Pathology (Trend), and Ophthalmology (Trend). Thus, in the vast majority of specialties, this scenario suggested that if all unnecessary services were eliminated, a surplus of physicians would exist in 2020. In most cases, the surplus would be in excess of 10 percent.

Primary Care Specialties

General/Family Medicine

General/Family physician demand was projected to grow at a faster pace than the baseline physician supply forecast in two demand scenarios and projected to grow at a slower pace than the baseline physician supply forecast in the other scenarios.

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 482 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 9 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 863 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 14 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 1 percent, demand was forecast to decline by 20 percent (Demographic) and 14 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 26 percent (Demographic) and 18 percent (Trend) in 2020.

General Internal Medicine

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 209 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 578 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 10 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 11 percent, demand was forecast to decline by 17 percent (Demographic) and 11 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet

the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 33 percent (Demographic) and 24 percent (Trend) in 2020.

General Pediatrics

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 19 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 145 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 4 percent, demand was forecast to decline by 30 percent (Demographic) and 25 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 37 percent (Demographic) and 28 percent (Trend) in 2020.

Figure 162 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care Specialties Detail

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care (Overall)	-710	-5%	-1,586	-11%	2,853	30%	2,217	22%
General/Family Medicine	-482	-9%	-863	-14%	1,067	26%	790	18%
General Internal Medicine	-209	-4%	-578	-10%	1,292	33%	1,024	24%
General Pediatrics	-19	-1%	-145	-7%	494	37%	403	28%
Full Insurance Environment								
Primary Care (Overall)	-1,233	-9%	-2,145	-15%	2,473	25%	1,812	17%
General/Family Medicine	-674	-12%	-1,068	-17%	927	22%	642	14%
General Internal Medicine	-466	-8%	-852	-14%	1,106	27%	826	19%
General Pediatrics	-94	-5%	-225	-11%	440	31%	345	23%

Non-Primary Care Specialties

Cardiology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 238 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the

demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 27 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 372 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 36 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 10 percent, demand was forecast to decline by 12 percent (Demographic) and increase by 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the predicted difference between supply and demand for Cardiologists in the Reduction of Unnecessary Services scenarios ranged from a 1 percent surplus (Demographic) to a 12 percent shortage (Trend) in 2020.

Other Internal Medicine Subspecialties

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 99 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 3 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 620 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 16 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 14 percent, demand was forecast to decline by 15 percent (Demographic) and 3 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 34 percent (Demographic) and 17 percent (Trend) in 2020.

Obstetrics and Gynecology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 41 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 2 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 218 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 11 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 3 percent, demand was forecast to decline by 27 percent (Demographic) and 16 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet

the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 41 percent (Demographic) and 23 percent (Trend) in 2020.

Pathology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 167 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 21 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 289 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 31 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 11 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the predicted difference between supply and demand for Pathologists in the Reduction of Unnecessary Services scenarios ranged from a 9 percent surplus (Demographic) to a 5 percent shortage (Trend) in 2020.

Figure 163 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Cardiology, Other Internal Medicine Subspecialties, Obstetrics and Gynecology, and Pathology

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Cardiology	-238	-27%	-372	-36%	9	1%	-89	-12%
Other Internal Medicine Subspecialties	-99	-3%	-620	-16%	856	34%	478	17%
Obstetrics and Gynecology	41	2%	-218	-11%	516	41%	328	23%
Pathology	-167	-21%	-289	-31%	55	9%	-33	-5%
Full Insurance Environment								
Cardiology	-274	-29%	-414	-39%	-17	-3%	-119	-15%
Other Internal Medicine Subspecialties	-277	-8%	-824	-20%	727	27%	330	11%
Obstetrics and Gynecology	-117	-6%	-400	-18%	401	29%	196	12%
Pathology	-215	-25%	-343	-35%	21	3%	-72	-10%

Psychiatry

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 163 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 11 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 382 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 23 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 5 percent, demand was forecast to decline by 22 percent (Demographic) and 10 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 23 percent (Demographic) and 7 percent (Trend) in 2020.

Anesthesiology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 52 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 275 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 16 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 11 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 33 percent (Demographic) and 16 percent (Trend) in 2020.

Radiology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 137 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 9 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 373 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 21 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 4 percent, demand was forecast to decline by 17 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 26 percent (Demographic) and 9 percent (Trend) in 2020.

Emergency Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 323 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 19 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 61 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 3 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 25 percent, demand was forecast to decline by 24 percent (Demographic) and 12 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 63 percent (Demographic) and 42 percent (Trend) in 2020.

Figure 164 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Psychiatry, Anesthesiology, Radiology, and Emergency Medicine

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Psychiatry	-163	-11%	-382	-23%	238	23%	79	7%
Anesthesiology	-52	-4%	-275	-16%	356	33%	194	16%
Radiology	-137	-9%	-373	-21%	296	26%	124	9%
Emergency Medicine	323	19%	61	3%	802	63%	613	42%
Full Insurance Environment								
Psychiatry	-166	-11%	-386	-23%	235	22%	76	6%
Anesthesiology	-130	-8%	-365	-20%	299	26%	129	10%
Radiology	-228	-14%	-477	-25%	230	19%	49	4%
Emergency Medicine	262	15%	-9	0%	758	58%	562	37%

General Surgery

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 284 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 15 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 569 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 26 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 2 percent, demand was forecast to decline by 17 percent (Demographic) and 4

percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 17 percent (Demographic) and 2 percent (Trend) in 2020.

Ophthalmology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 157 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 20 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 275 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 30 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 6 percent, demand was forecast to decline by 15 percent (Demographic) and 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the predicted difference between supply and demand for Pathologists in the Reduction of Unnecessary Services scenarios ranged from a 10 percent surplus (Demographic) to a 4 percent shortage (Trend) in 2020.

Otolaryngology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 35 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 10 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 87 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 22 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 2 percent, demand was forecast to decline by 21 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 24 percent (Demographic) and 8 percent (Trend) in 2020.

Orthopedic Surgery

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 130 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 14 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 273 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 25 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 2 percent, demand was forecast to decline by 18 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 19 percent (Demographic) and 4 percent (Trend) in 2020.

Figure 165 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, General Surgery, Ophthalmology, Otolaryngology, and Orthopedic Surgery

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
General Surgery	-284	-15%	-569	-26%	237	17%	30	2%
Ophthalmology	-157	-20%	-275	-30%	60	10%	-26	-4%
Otolaryngology	-35	-10%	-87	-22%	60	24%	22	8%
Orthopedic Surgery	-130	-14%	-273	-25%	134	19%	30	4%
Full Insurance Environment								
General Surgery	-384	-19%	-683	-30%	164	11%	-53	-3%
Ophthalmology	-171	-21%	-291	-32%	49	8%	-38	-6%
Otolaryngology	-58	-16%	-114	-27%	43	16%	3	1%
Orthopedic Surgery	-194	-19%	-348	-30%	87	12%	-24	-3%

Urology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 71 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 16 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 138 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 27 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was not forecast to change, demand was forecast to decline by 14 percent (Demographic) and 1 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 16 percent (Demographic) and 1 percent (Trend) in 2020.

Other Surgical Subspecialties

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 106 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 16 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 205 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 27 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 2 percent, demand was forecast to decline by 15 percent (Demographic) and 3 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 16 percent (Demographic) and 1 percent (Trend) in 2020.

Figure 166 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Urology and Other Surgical Subspecialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Urology	-71	-16%	-138	-27%	51	16%	3	1%
Other Surgical Subspecialties	-106	-16%	-205	-27%	76	16%	4	1%
Full Insurance Environment								
Urology	-93	-20%	-163	-30%	35	10%	-15	-4%
Other Surgical Subspecialties	-139	-20%	-244	-30%	52	10%	-24	-4%

State Level Supply Scenario 3: 10 percent Increase in Physician Productivity

Under the constant insurance environment, in the Demographic Only Scenario forecast, supply growth outpaced demand growth by 2,921 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 9 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 1,098 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 3 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 21 percent, demand was forecast to decline by 19 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 50 percent (Demographic) and 34 percent (Trend) in 2020.

Figure 167 – Projected Difference Between Physician Supply and Demand in Michigan in 2020

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
All Physicians	2,921	9%	-1,098	-3%	12,240	50%	9,326	34%
Full Insurance Environment								
All Physicians	1,283	4%	-2,939	-7%	11,052	43%	7,991	28%

Primary Care in Aggregate

In the aggregate, primary care physician supply was projected to grow at a faster pace than the primary care physician demand forecast in all demand scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, supply growth outpaced demand growth by 1,224 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 9 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 347 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 3 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 21 percent, demand was forecast to decline by 20 percent (Demographic) and 15 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 51 percent (Demographic) and 41 percent (Trend) in 2020.

Non-Primary Care in Aggregate

In the aggregate, non-primary care physician demand was projected to grow at a faster pace than the non-primary care physician supply forecast in the Trend Scenario and projected to grow at a slower pace than the non-primary care physician supply forecast in the other three scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, supply growth outpaced demand growth by 1,697 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to about 8 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 1,446 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 6 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 22 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 49 percent (Demographic) and 30 percent (Trend) in 2020.

Figure 168 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care and Non-Primary Care Specialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care	1,224	9%	347	3%	4,786	51%	4,151	41%
Non-Primary Care	1,697	8%	-1,446	-6%	7,454	49%	5,176	30%
Full Insurance Environment								
Primary Care	700	5%	-211	-1%	4,406	45%	3,746	36%
Non-Primary Care	583	3%	-2,728	-11%	6,646	42%	4,246	23%

Specialty-Specific Supply and Demand Relationships

In the Demographic Only Scenario, demand was forecast to grow at a faster rate than supply in Cardiology, General Surgery, Ophthalmology, Urology, and other Surgical Specialties. Thus, in most specialties, the Demographic Only Scenario forecasts suggested that there would be a surplus of physicians in the state in 2020. The surplus was forecast to be most significant in General Pediatrics, Obstetrics and Gynecology, and Emergency Medicine where the forecast surplus was at least 15 percent of the forecast demand for physicians in those specialties.

In the Trend Scenario, demand was forecast to grow at a faster rate than supply in General/Family Medicine, Cardiology, Pathology, Psychiatry, Anesthesiology, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other Surgery Subspecialties. Thus, in those specialties, the Trend Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology and Pathology where the difference between physician supply and demand was forecast to be at least 20 percent of the forecast demand for physicians in those specialties.

In the Reduction of Unnecessary Services scenarios, supply was forecast to grow at a faster rate than demand in all specialties except Cardiology (Trend in Full Insurance Environment). Thus,

in the vast majority of specialties, this scenario suggested that if all unnecessary services were eliminated, a surplus of physicians would exist in 2020. In many cases, the surplus would be in excess of 30 percent.

Primary Care Specialties

General/Family Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 331 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 6 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 50 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 1 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 17 percent, demand was forecast to decline by 20 percent (Demographic) and 14 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 46 percent (Demographic) and 37 percent (Trend) in 2020.

General Internal Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 620 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 11 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 250 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 4 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 28 percent, demand was forecast to decline by 17 percent (Demographic) and 11 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 54 percent (Demographic) and 44 percent (Trend) in 2020.

General Pediatrics

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 273 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 15 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 147 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 11 percent, demand was forecast to decline by 30 percent (Demographic) and 25 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 58 percent (Demographic) and 48 percent (Trend) in 2020.

Figure 169 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care Specialties Detail

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care (Overall)	1,224	9%	347	3%	4,786	51%	4,151	41%
General/Family Medicine	331	6%	-50	-1%	1,880	46%	1,603	37%
General Internal Medicine	620	11%	250	4%	2,121	54%	1,853	44%
General Pediatrics	273	15%	147	7%	786	58%	694	48%
Full Insurance Environment								
Primary Care (Overall)	700	5%	-211	-1%	4,406	45%	3,746	36%
General/Family Medicine	139	2%	-255	-4%	1,740	41%	1,455	32%
General Internal Medicine	363	6%	-23	0%	1,935	47%	1,655	37%
General Pediatrics	198	10%	67	3%	731	52%	636	42%

Non-Primary Care Specialties

Cardiology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 134 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 15 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 268 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 26 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 4 percent, demand was forecast to decline by 12 percent (Demographic) and increase

by 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 17 percent (Demographic) and 2 percent (Trend) in 2020.

Other Internal Medicine Subspecialties

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 434 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 13 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 87 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 2 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 31 percent, demand was forecast to decline by 15 percent (Demographic) and 3 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 55 percent (Demographic) and 35 percent (Trend) in 2020.

Obstetrics and Gynecology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 320 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 19 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 61 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 3 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 19 percent, demand was forecast to decline by 27 percent (Demographic) and 16 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 64 percent (Demographic) and 42 percent (Trend) in 2020.

Pathology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 66 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 8 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 187 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 20 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 4 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 27 percent (Demographic) and 10 percent (Trend) in 2020.

Figure 170 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Cardiology, Other Internal Medicine Subspecialties, Obstetrics and Gynecology, and Pathology

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Cardiology	-134	-15%	-268	-26%	113	17%	15	2%
Other Internal Medicine Subspecialties	434	13%	-87	-2%	1,388	55%	1010	35%
Obstetrics and Gynecology	320	19%	61	3%	795	64%	607	42%
Pathology	-66	-8%	-187	-20%	157	27%	69	10%
Full Insurance Environment								
Cardiology	-170	-18%	-310	-29%	87	13%	-15	-2%
Other Internal Medicine Subspecialties	256	7%	-292	-7%	1259	48%	862	28%
Obstetrics and Gynecology	162	9%	-121	-6%	680	50%	475	30%
Pathology	-113	-13%	-242	-25%	122	20%	29	4%

Psychiatry

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 41 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 3 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 177 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 11 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 10 percent, demand was forecast to decline by 22 percent (Demographic) and 10 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 42 percent (Demographic) and 23 percent (Trend) in 2020.

Anesthesiology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 174 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 12 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 49 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 3 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 28 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 54 percent (Demographic) and 34 percent (Trend) in 2020.

Radiology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 90 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 6 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 146 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 8 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 21 percent, demand was forecast to decline by 17 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 46 percent (Demographic) and 27 percent (Trend) in 2020.

Emergency Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 649 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 37 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 388 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 19 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 45 percent, demand was forecast to decline by 24 percent (Demographic) and 12 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 83 percent (Demographic) and 59 percent (Trend) in 2020.

Figure 171 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Psychiatry, Anesthesiology, Radiology, and Emergency Medicine

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Psychiatry	41	3%	-177	-11%	442	42%	283	23%
Anesthesiology	174	12%	-49	-3%	582	54%	420	34%
Radiology	90	6%	-146	-8%	522	46%	351	27%
Emergency Medicine	649	37%	388	19%	1,129	89%	939	65%
Full Insurance Environment								
Psychiatry	38	3%	-181	-11%	439	42%	280	23%
Anesthesiology	95	6%	-139	-8%	525	46%	355	27%
Radiology	-1	0%	-251	-13%	457	38%	275	20%
Emergency Medicine	588	33%	317	15%	1,084	83%	888	59%

General Surgery

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 30 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 2 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 315 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 14 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 13 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 36 percent (Demographic) and 18 percent (Trend) in 2020.

Ophthalmology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 57 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 175 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 19 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 9 percent, demand was forecast to decline by 15 percent (Demographic) and 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 28 percent (Demographic) and 11 percent (Trend) in 2020.

Otolaryngology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 14 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 38 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 10 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 14 percent, demand was forecast to decline by 21 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 43 percent (Demographic) and 25 percent (Trend) in 2020.

Orthopedic Surgery

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 1 physician by 2020. Thus, the supply and demand for Orthopedic Surgeons was forecast to be in balanced in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 143 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 13 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 14 percent, demand was forecast to decline by 18 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 38 percent (Demographic) and 20 percent (Trend) in 2020.

Figure 172 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, General Surgery, Ophthalmology, Otolaryngology, and Orthopedic Surgery

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
General Surgery	-30	-2%	-315	-14%	491	36%	284	18%
Ophthalmology	-57	-7%	-175	-19%	159	28%	73	11%
Otolaryngology	14	4%	-38	-10%	109	43%	71	25%
Orthopedic Surgery	1	0%	-143	-13%	265	38%	161	20%
Full Insurance Environment								
General Surgery	-130	-7%	-429	-19%	419	29%	201	12%
Ophthalmology	-72	-9%	-192	-21%	148	26%	61	9%
Otolaryngology	-9	-2%	-64	-15%	93	35%	52	17%
Orthopedic Surgery	-63	-6%	-217	-18%	218	29%	107	12%

Urology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 12 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 3 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 79 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 15 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 15 percent, demand was forecast to decline by 14 percent (Demographic) and 1 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 34 percent (Demographic) and 17 percent (Trend) in 2020.

Other Surgical Subspecialties

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 18 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 3 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 118 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 15 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 13 percent, demand was forecast to decline by 15 percent (Demographic) and 3

percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 34 percent (Demographic) and 17 percent (Trend) in 2020.

Figure 173 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Urology and Other Surgical Subspecialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Urology	-12	-3%	-79	-15%	110	34%	62	17%
Other Surgical Subspecialties	-18	-3%	-118	-15%	164	34%	92	17%
Full Insurance Environment								
Urology	-34	-7%	-104	-19%	94	28%	44	11%
Other Surgical Subspecialties	-51	-7%	-156	-19%	140	28%	64	11%

State Level Supply Scenario 4: 10 percent Increase in Physician Productivity / 5 percent Reduction in Physician Effort

Under the constant insurance environment, in the Demographic Only Scenario forecast, supply growth outpaced demand growth by 1,248 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 2,771 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 16 percent, demand was forecast to decline by 19 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 36 percent (Demographic) and 22 percent (Trend) in 2020.

Figure 174 – Projected Difference Between Physician Supply and Demand in Michigan in 2020

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
All Physicians	1,248	4%	-2,771	-7%	10,567	43%	7,653	28%
Full Insurance Environment								
All Physicians	-390	-1%	-4,612	-12%	9,379	36%	6,318	22%

Primary Care in Aggregate

In the aggregate, primary care physician supply was projected to grow at a faster pace than the primary care physician demand forecast in all demand scenarios, except the Trend Scenario.

Under the constant insurance environment, in the Demographic Only Scenario forecast, supply growth outpaced demand growth by 579 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 297 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 2 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 15 percent, demand was forecast to decline by 20 percent (Demographic) and 15 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 44 percent (Demographic) and 35 percent (Trend) in 2020.

Non-Primary Care in Aggregate

In the aggregate, non-primary care physician demand was projected to grow at a faster pace than the non-primary care physician supply forecast in the Demographic and Trend Scenarios and projected to grow at a slower pace than the non-primary care physician supply forecast in the other scenarios.

Under the constant insurance environment, in the Demographic Only Scenario forecast, demand growth outpaced supply growth by 669 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to about 3 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 2,474 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 10 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 16 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 42 percent (Demographic) and 24 percent (Trend) in 2020.

Figure 175 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care and Non-Primary Care Specialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care	579	4%	-297	-2%	4,141	44%	3,506	35%
Non-Primary Care	669	3%	-2,474	-10%	6,426	42%	4,147	24%
Full Insurance Environment								
Primary Care	56	0%	-856	-6%	3,762	39%	3,101	30%
Non-Primary Care	-446	-2%	-3,757	-15%	5,617	35%	3,217	17%

Specialty-Specific Supply and Demand Relationships

In the Demographic Only Scenario, demand was forecast to grow at a faster rate than supply in Cardiology, Pathology, Psychiatry, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other Surgical Subspecialties. Thus, in most specialties, the Demographic Only Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology where the forecast surplus was more than 20 percent of the forecast demand for physicians in those specialties.

In the Trend Scenario, demand was forecast to grow at a faster rate than supply in all specialties except General Pediatrics and Emergency Medicine. Thus, in most specialties, the Trend Scenario forecasts suggested that there would be a shortage of physicians in the state in 2020. The shortage was forecast to be most acute in Cardiology, Pathology, and Ophthalmology where the difference between physician supply and demand was forecast to be at least 20 percent of the forecast demand for physicians in those specialties.

In the Reduction of Unnecessary Services scenarios, supply was forecast to grow at a faster rate than demand in all specialties except Cardiology (Trend). Thus, in the vast majority of specialties, this scenario suggested that if all unnecessary services were eliminated, a surplus of physicians would exist in 2020. In many cases, the surplus would be in excess of 30 percent.

Primary Care Specialties

General/Family Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 60 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 321 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 5 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 12 percent, demand was forecast to decline by 20 percent (Demographic) and 14 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 39 percent (Demographic) and 31 percent (Trend) in 2020.

General Internal Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 343 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 6 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 26 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to less than 1 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 22 percent, demand was forecast to decline by 17 percent (Demographic) and 11 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 47 percent (Demographic) and 37 percent (Trend) in 2020.

General Pediatrics

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 176 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 9 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 50 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 2 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 6 percent, demand was forecast to decline by 30 percent (Demographic) and 25 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 51 percent (Demographic) and 41 percent (Trend) in 2020.

Figure 176 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Primary Care Specialties Detail

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Primary Care (Overall)	579	4%	-297	-2%	4,141	44%	3,506	35%
General/Family Medicine	60	1%	-321	-5%	1,609	39%	1,332	31%
General Internal Medicine	343	6%	-26	0%	1,844	47%	1,577	37%
General Pediatrics	176	9%	50	2%	689	51%	597	41%
Full Insurance Environment								
Primary Care (Overall)	56	0%	-856	-6%	3,762	39%	3,101	30%
General/Family Medicine	-132	-2%	-526	-8%	1,469	35%	1,184	26%
General Internal Medicine	87	2%	-299	-5%	1,659	40%	1,378	31%
General Pediatrics	101	5%	-30	-1%	634	45%	539	36%

Non-Primary Care Specialties

Cardiology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 168 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 19 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 303 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 29 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 1 percent, demand was forecast to decline by 12 percent (Demographic) and increase by 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the predicted difference between supply and

demand for Cardiologists in the Reduction of Unnecessary Services scenarios ranged from a 12 percent surplus (Demographic) to a 3 percent shortage (Trend) in 2020.

Other Internal Medicine Subspecialties

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 256 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 265 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 25 percent, demand was forecast to decline by 15 percent (Demographic) and 3 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 48 percent (Demographic) and 29 percent (Trend) in 2020.

Obstetrics and Gynecology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 227 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 13 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 32 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 2 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 14 percent, demand was forecast to decline by 27 percent (Demographic) and 16 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 56 percent (Demographic) and 36 percent (Trend) in 2020.

Pathology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 100 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 12 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 221 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 24 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to contract by 1 percent, demand was forecast to decline by 18 percent (Demographic) and 6 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 21 percent (Demographic) and 5 percent (Trend) in 2020.

Figure 177 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Cardiology, Other Internal Medicine Subspecialties, Obstetrics and Gynecology, and Pathology

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Cardiology	-168	-19%	-303	-29%	78	12%	-19	-3%
Other Internal Medicine Subspecialties	256	7%	-265	-7%	1,211	48%	833	29%
Obstetrics and Gynecology	227	13%	-32	-2%	702	56%	514	36%
Pathology	-100	-12%	-221	-24%	123	21%	35	5%
Full Insurance Environment								
Cardiology	-204	-22%	-344	-32%	52	8%	-49	-6%
Other Internal Medicine Subspecialties	78	2%	-469	-11%	1082	41%	684	22%
Obstetrics and Gynecology	69	4%	-214	-10%	587	43%	382	24%
Pathology	-147	-17%	-276	-28%	89	14%	-5	-1%

Psychiatry

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 27 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 2 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 245 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 15 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 5 percent, demand was forecast to decline by 22 percent (Demographic) and 10 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 35 percent (Demographic) and 18 percent (Trend) in 2020.

Anesthesiology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 98 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 124 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 7 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 22 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 47 percent (Demographic) and 28 percent (Trend) in 2020.

Radiology

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 14 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 222 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 12 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 15 percent, demand was forecast to decline by 17 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 39 percent (Demographic) and 21 percent (Trend) in 2020.

Emergency Medicine

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 541 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Demographic Only Scenario amounted to 31 percent in 2020.

In the Trend Scenario, supply growth outpaced demand growth by 279 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Trend Scenario amounted to 14 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 38 percent, demand was forecast to decline by 24 percent (Demographic) and 12 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 81 percent (Demographic) and 57 percent (Trend) in 2020.

Figure 178 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Psychiatry, Anesthesiology, Radiology, and Emergency Medicine

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Psychiatry	-27	-2%	-245	-15%	374	35%	215	18%
Anesthesiology	98	7%	-124	-7%	506	47%	345	28%
Radiology	14	1%	-222	-12%	447	39%	275	21%
Emergency Medicine	541	31%	279	14%	1,020	81%	830	57%
Full Insurance Environment								
Psychiatry	-30	-2%	-250	-15%	371	35%	212	17%
Anesthesiology	20	1%	-214	-12%	450	40%	280	21%
Radiology	-76	-5%	-326	-17%	381	32%	200	14%
Emergency Medicine	479	27%	208	10%	975	75%	779	52%

General Surgery

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 115 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 6 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 399 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 18 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 8 percent, demand was forecast to decline by 17 percent (Demographic) and 4 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 30 percent (Demographic) and 13 percent (Trend) in 2020.

Ophthalmology

In the Demographic Only Scenario forecast, demand growth outpaced supply change by 90 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 11 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 208 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 23 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 4 percent, demand was forecast to decline by 15 percent (Demographic) and 2 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 22 percent (Demographic) and 6 percent (Trend) in 2020.

Otolaryngology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 2 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 1 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 55 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 14 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 8 percent, demand was forecast to decline by 21 percent (Demographic) and 9 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 37 percent (Demographic) and 19 percent (Trend) in 2020.

Orthopedic Surgery

In the Demographic Only Scenario forecast, supply growth outpaced demand growth by 42 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 4 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 186 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 17 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 8 percent, demand was forecast to decline by 18 percent (Demographic) and 5 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 32 percent (Demographic) and 15 percent (Trend) in 2020.

Figure 179 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, General Surgery, Ophthalmology, Otolaryngology, and Orthopedic Surgery

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
General Surgery	-115	-6%	-399	-18%	406	30%	200	13%
Ophthalmology	-90	-11%	-208	-23%	126	22%	40	6%
Otolaryngology	-2	-1%	-55	-14%	93	37%	55	19%
Orthopedic Surgery	-42	-4%	-186	-17%	221	32%	117	15%
Full Insurance Environment								
General Surgery	-215	-11%	-514	-22%	334	23%	117	7%
Ophthalmology	-105	-13%	-225	-24%	115	20%	28	4%
Otolaryngology	-25	-7%	-81	-19%	76	28%	36	12%
Orthopedic Surgery	-107	-10%	-261	-22%	174	24%	63	7%

Urology

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 32 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 99 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 19 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 10 percent, demand was forecast to decline by 14 percent (Demographic) and 1 percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 28 percent (Demographic) and 11 percent (Trend) in 2020.

Other Surgical Subspecialties

In the Demographic Only Scenario forecast, demand growth outpaced supply growth by 47 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Demographic Only Scenario amounted to 7 percent in 2020.

In the Trend Scenario, demand growth outpaced supply growth by 147 physicians by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 19 percent in 2020.

In the Reduction of Unnecessary Services scenarios, while the supply of physicians was forecast to grow by 8 percent, demand was forecast to decline by 15 percent (Demographic) and 3

percent (Trend) by 2020. Expressed as a percentage of the number of physicians required to meet the demand for their services, the surplus predicted in the Reduction of Unnecessary Services scenarios amounted to 28 percent (Demographic) and 11 percent (Trend) in 2020.

Figure 180 – Projected Difference Between Physician Supply and Demand in Michigan in 2020, Urology and Other Surgical Subspecialties

	Demographic Only Scenario		Trend Scenario		Reduction of Unnecessary Services and Demographic Scenario		Reduction of Unnecessary Services and Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
Constant Insurance Environment								
Urology	-32	-7%	-99	-19%	90	28%	42	11%
Other Surgical Subspecialties	-47	-7%	-147	-19%	135	28%	63	11%
Full Insurance Environment								
Urology	-53	-11%	-123	-23%	75	22%	24	6%
Other Surgical Subspecialties	-81	-12%	-185	-23%	111	22%	35	6%

Relationship between Physician Supply and Demand in Michigan Through 2020: Regional Analysis

As with the state-level supply and demand summaries, in order to clearly indicate the relationship between the projected regional physician supply and demand in Michigan in 2020, the results of the supply and demand projections are compared in a side-by-side fashion. For each of the two regional supply scenarios, the projected regional shortage or surplus of physicians is presented by specialty in both regional demand scenarios.

Regional Supply Scenario 1: Baseline Supply Non-Responsive to Demand

In this supply scenario, it was assumed that physicians would continue to locate their practices as they had in 2005 rather than responding to changes in regional demand. In most regions, demand was forecast to grow more quickly than supply, yielding shortages of physicians in 2020. There were some exceptions, especially in the Demographic Only demand scenario.

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 651 physicians in the Ann Arbor Area region. Demand for primary care physicians was forecast to grow by 163 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 488 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, and Ophthalmology, with shortages projected to exceed 25 percent.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 1,234 physicians in the region. Demand for primary care physicians was forecast to grow by 248 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 986 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, General Surgery,

Ophthalmology, Orthopedic Surgery, Urology, and other surgical specialties, with shortages projected to exceed 30 percent.

Figure 181 – Projected Difference Between Physician Supply and Demand in the Ann Arbor Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-651**	**-14%**	**-1,234**	**-24%**
Primary Care	*-163*	*-13%*	*-248*	*-18%*
General/Family Medicine	-47	-16%	-67	-21%
General Internal Medicine	-100	-14%	-149	-19%
General Pediatrics	-16	-7%	-32	-13%
Non-Primary Care	*-488*	*-15%*	*-986*	*-26%*
Cardiovascular Diseases	-48	-36%	-67	-45%
Other Internal Medicine Subspecialties	-85	-12%	-193	-23%
Obstetrics and Gynecology	-5	-3%	-31	-16%
Pathology	-40	-27%	-63	-36%
Psychiatry	-42	-16%	-82	-27%
Anesthesiology	-28	-12%	-64	-23%
Radiology	-38	-18%	-70	-29%
Emergency Medicine	20	11%	-6	-3%
General Surgery	-56	-23%	-93	-33%
Ophthalmology	-27	-29%	-41	-38%
Otolaryngology	-7	-13%	-15	-24%
Orthopedic Surgery	-22	-20%	-39	-30%
Urology	-17	-24%	-27	-34%
Other Surgical Specialties	-27	-22%	-45	-32%

Figure 182 – Projected Difference Between Physician Supply and Demand in the Detroit Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**614**	**4%**	**-1,236**	**-7%**
Primary Care	*251*	*4%*	*-144*	*-2%*
General/Family Medicine	2	0%	-137	-6%
General Internal Medicine	173	6%	-19	-1%
General Pediatrics	76	8%	12	1%
Non-Primary Care	*363*	*4%*	*-1,092*	*-10%*
Cardiovascular Diseases	-72	-17%	-135	-28%
Other Internal Medicine Subspecialties	150	9%	-95	-5%
Obstetrics and Gynecology	93	11%	-37	-4%
Pathology	-46	-11%	-105	-23%
Psychiatry	-13	-2%	-114	-15%
Anesthesiology	52	8%	-41	-6%
Radiology	13	2%	-99	-12%
Emergency Medicine	226	30%	112	13%
General Surgery	-49	-6%	-180	-18%
Ophthalmology	-41	-11%	-98	-22%
Otolaryngology	0	0%	-22	-13%
Orthopedic Surgery	-12	-3%	-70	-16%
Urology	-12	-6%	-43	-18%
Other Surgical Specialties	-16	-5%	-59	-18%

In the Demographic Only scenario, the supply of physicians was forecast to outpace demand by 614 physicians in the Detroit Area region. The supply of primary care physicians was forecast to grow by 251 more physicians than demand, while the supply for non-primary care physicians was forecast to grow by 363 more physicians than demand. A number of specialties, however, were forecast to experience shortages, including Cardiology, Pathology, Psychiatry, General Surgery, Ophthalmology, Orthopedic Surgery, Urology, and other surgical specialties.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 1,236 physicians in the region. Demand for primary care physicians was forecast to grow by 144 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 1,092 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, Psychiatry, General Surgery, Ophthalmology, Orthopedic Surgery, Urology, and other surgical specialties, with shortages projected to exceed 15 percent.

Figure 183 – Projected Difference Between Physician Supply and Demand in the East Central Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-8**	**-5%**	**-26**	**-14%**
Primary Care	*-7*	*-6%*	*-14*	*-12%*
General/Family Medicine	-6	-9%	-10	-15%
General Internal Medicine	-1	-4%	-3	-10%
General Pediatrics	0	7%	0	1%
Non-Primary Care	*-2*	*-2%*	*-13*	*-15%*
Cardiovascular Diseases	0	-26%	-1	-35%
Other Internal Medicine Subspecialties	0	-3%	-3	-16%
Obstetrics and Gynecology	1	9%	-1	-5%
Pathology	-1	-17%	-1	-27%
Psychiatry	0	-13%	-1	-25%
Anesthesiology	0	-2%	0	-15%
Radiology	0	-8%	0	-20%
Emergency Medicine	2	17%	0	1%
General Surgery	-2	-13%	-4	-25%
Ophthalmology	0	-18%	-1	-29%
Otolaryngology	0	4%	0	-9%
Orthopedic Surgery	0	--	0	--
Urology	0	-11%	0	-23%
Other Surgical Specialties	0	-18%	0	-29%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by just 8 physicians in the East Central region. Demand for primary care physicians was forecast to grow by 7 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 2 more physicians than the supply. The specialty forecast to experience the greatest shortage expressed as a percentage of demand was Cardiology with a projected shortage exceeding 25 percent. Many specialties were forecast to experience shortages of smaller than 0.5 FTE physicians.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 26 physicians in the region. Demand for primary care physicians was forecast to grow by 14 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 13 more physicians than the supply. The specialties forecast to experience the greatest shortages were General/Family Medicine, General Internal Medicine, Internal Medicine Subspecialties (other than Cardiology), and General Surgery, with shortages projected to exceed 3 physicians. As in the previous scenario, a number of specialties were forecast to experience shortages of smaller than 0.5 FTE physicians.

Figure 184 – Projected Difference Between Physician Supply and Demand in the Flint Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**84**	**6%**	**-74**	**-5%**
Primary Care	*45*	*6%*	*-7*	*-1%*
General/Family Medicine	12	3%	-14	-3%
General Internal Medicine	27	9%	6	2%
General Pediatrics	7	9%	1	2%
Non-Primary Care	*39*	*6%*	*-67*	*-8%*
Cardiovascular Diseases	-5	-17%	-10	-27%
Other Internal Medicine Subspecialties	15	12%	-4	-3%
Obstetrics and Gynecology	11	14%	0	-1%
Pathology	-3	-10%	-7	-22%
Psychiatry	0	0%	-5	-13%
Anesthesiology	5	10%	-3	-5%
Radiology	2	3%	-10	-11%
Emergency Medicine	15	32%	8	15%
General Surgery	-2	-4%	-12	-16%
Ophthalmology	-2	-11%	-5	-23%
Otolaryngology	1	4%	-1	-9%
Orthopedic Surgery	-1	-2%	-6	-15%
Urology	0	-4%	-2	-17%
Other Surgical Specialties	-1	-5%	-5	-18%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the supply of physicians was forecast to outpace demand by 84 physicians in the Flint Area region. The supply of primary care physicians was forecast to grow by 45 more physicians than demand, while the supply for non-primary care physicians was forecast to grow by 39 more physicians than demand. A number of specialties, however, were forecast to experience shortages, including Cardiology, Pathology, General Surgery, Ophthalmology, Orthopedic Surgery, Urology, and other surgical specialties. The forecast shortages were most acute in Cardiology, Pathology, and Ophthalmology.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 74 physicians in the region. Demand for primary care physicians was forecast to grow by 7 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 67 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, General Surgery, Ophthalmology, Orthopedic Surgery, Urology, and other surgical specialties, with shortages projected to exceed 15 percent.

Figure 185 – Projected Difference Between Physician Supply and Demand in the Grand Rapids-Muskegon Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-255**	**-8%**	**-646**	**-18%**
Primary Care	*-101*	*-8%*	*-186*	*-14%*
General/Family Medicine	-68	-10%	-112	-16%
General Internal Medicine	-23	-6%	-51	-12%
General Pediatrics	-9	-5%	-22	-11%
Non-Primary Care	*-154*	*-8%*	*-460*	*-20%*
Cardiovascular Diseases	-16	-27%	-24	-37%
Other Internal Medicine Subspecialties	-9	-3%	-50	-16%
Obstetrics and Gynecology	-3	-2%	-33	-15%
Pathology	-14	-22%	-24	-32%
Psychiatry	-14	-14%	-29	-25%
Anesthesiology	-8	-4%	-36	-16%
Radiology	-16	-10%	-40	-22%
Emergency Medicine	33	15%	0	0%
General Surgery	-33	-16%	-63	-27%
Ophthalmology	-16	-20%	-28	-31%
Otolaryngology	-5	-14%	-11	-25%
Orthopedic Surgery	-20	-14%	-41	-25%
Urology	-8	-16%	-15	-27%
Other Surgical Specialties	-15	-17%	-28	-28%

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 255 physicians in the Grand Rapids-Muskegon region. Demand for primary care physicians was forecast to grow by 101 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 154 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, and Ophthalmology, with shortages projected to exceed 20 percent.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 646 physicians in the region. Demand for primary care physicians was forecast to grow by 186 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 460 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, Psychiatry, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other surgical specialties, with shortages projected to exceed 25 percent.

Figure 186 – Projected Difference Between Physician Supply and Demand in the Jackson Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-11**	**-2%**	**-89**	**-12%**
Primary Care	*-2*	*-1%*	*-20*	*-7%*
General/Family Medicine	-5	-3%	-15	-9%
General Internal Medicine	0	0%	-6	-6%
General Pediatrics	3	7%	0	1%
Non-Primary Care	*-9*	*-2%*	*-69*	*-15%*
Cardiovascular Diseases	-5	-25%	-8	-34%
Other Internal Medicine Subspecialties	0	1%	-9	-13%
Obstetrics and Gynecology	3	9%	-2	-5%
Pathology	-3	-18%	-5	-29%
Psychiatry	-2	-7%	-7	-19%
Anesthesiology	1	2%	-4	-11%
Radiology	-1	-4%	-5	-17%
Emergency Medicine	8	26%	4	10%
General Surgery	-4	-10%	-9	-22%
Ophthalmology	-3	-16%	-7	-27%
Otolaryngology	0	-4%	-2	-17%
Orthopedic Surgery	-2	-9%	-5	-21%
Urology	-1	-11%	-2	-23%
Other Surgical Specialties	-1	-11%	-1	-22%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 11 physicians in the Jackson Area region. Demand for primary care physicians was forecast to grow by 2 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 9 more physicians than the supply. The specialty forecast to experience the greatest shortage expressed as a percentage of demand was Cardiology with a projected shortage of 25 percent.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 89 physicians in the region. Demand for primary care physicians was forecast to grow by 20 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 69 more physicians than the supply. The specialties forecast to experience the greatest shortages were Cardiology, Pathology and Ophthalmology, with projected shortages exceeding 25 percent.

Figure 187 – Projected Difference Between Physician Supply and Demand in Kalamazoo-Battle Creek Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**32**	**2%**	**-164**	**-9%**
Primary Care	*8*	*1%*	*-34*	*-5%*
General/Family Medicine	-4	-2%	-23	-8%
General Internal Medicine	10	4%	-6	-2%
General Pediatrics	2	2%	-5	-5%
Non-Primary Care	*24*	*2%*	*-130*	*-11%*
Cardiovascular Diseases	-8	-19%	-15	-29%
Other Internal Medicine Subspecialties	10	6%	-14	-8%
Obstetrics and Gynecology	7	10%	-3	-4%
Pathology	-4	-13%	-8	-24%
Psychiatry	-5	-5%	-21	-17%
Anesthesiology	4	7%	-5	-7%
Radiology	-1	-2%	-10	-14%
Emergency Medicine	36	27%	16	11%
General Surgery	-6	-7%	-20	-19%
Ophthalmology	-5	-13%	-10	-24%
Otolaryngology	-1	-9%	-4	-21%
Orthopedic Surgery	-4	-6%	-14	-18%
Urology	-2	-8%	-4	-20%
Other Surgical Specialties	-2	-8%	-7	-20%

In the Demographic Only scenario, the supply of physicians was forecast to outpace demand by 32 physicians in the Kalamazoo-Battle Creek region. The supply of primary care physicians was forecast to grow by 8 more physicians than demand, while the supply for non-primary care physicians was forecast to grow by 24 more physicians than demand. A number of specialties, however, were forecast to experience shortages, including Cardiology, Pathology, Psychiatry, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other surgical specialties. The forecast shortages were most acute in Cardiology, Pathology, and Ophthalmology, with shortages projected to exceed 10 percent.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 164 physicians in the region. Demand for primary care physicians was forecast to grow by 34 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 130 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, Ophthalmology, Otolaryngology, Urology, and other surgical specialties, with shortages projected to exceed 20 percent.

Figure 188 – Projected Difference Between Physician Supply and Demand in the Lansing Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-46**	**-3%**	**-246**	**-13%**
Primary Care	*-24*	*-3%*	*-72*	*-10%*
General/Family Medicine	-21	-6%	-47	-12%
General Internal Medicine	-5	-2%	-19	-8%
General Pediatrics	2	2%	-6	-5%
Non-Primary Care	*-22*	*-2%*	*-174*	*-15%*
Cardiovascular Diseases	-15	-28%	-24	-37%
Other Internal Medicine Subspecialties	1	0%	-21	-13%
Obstetrics and Gynecology	10	12%	-3	-3%
Pathology	-4	-17%	-8	-28%
Psychiatry	-6	-6%	-21	-18%
Anesthesiology	0	0%	-11	-13%
Radiology	-4	-6%	-14	-18%
Emergency Medicine	27	27%	12	10%
General Surgery	-10	-13%	-23	-24%
Ophthalmology	-7	-20%	-12	-31%
Otolaryngology	0	-3%	-2	-16%
Orthopedic Surgery	-4	-10%	-10	-22%
Urology	-3	-16%	-6	-27%
Other Surgical Specialties	-4	-13%	-8	-25%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 46 physicians in the Lansing Area region. Demand for primary care physicians was forecast to grow by 24 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 22 more physicians than the supply. The specialties forecast to experience the greatest shortage expressed as a percentage of demand was Cardiology and Ophthalmology, with shortages projected to exceed 20 percent.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 246 physicians in the region. Demand for primary care physicians was forecast to grow by 72 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 174 more physicians than the supply. The specialties forecast to experience the greatest shortages were Cardiology, Pathology, Ophthalmology, Urology and other surgical specialties, with projected shortages exceeding 25 percent.

Figure 189 – Projected Difference Between Physician Supply and Demand in the Northeast Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-14**	**-5%**	**-45**	**-14%**
Primary Care	*-8*	*-6%*	*-18*	*-12%*
General/Family Medicine	-7	-8%	-14	-14%
General Internal Medicine	-1	-4%	-4	-10%
General Pediatrics	1	7%	0	1%
Non-Primary Care	*-6*	*-4%*	*-27*	*-17%*
Cardiovascular Diseases	-1	-26%	-1	-35%
Other Internal Medicine Subspecialties	-1	-4%	-3	-17%
Obstetrics and Gynecology	0	2%	-1	-11%
Pathology	-1	-17%	-2	-27%
Psychiatry	-1	-13%	-1	-25%
Anesthesiology	-1	-3%	-3	-16%
Radiology	-1	-9%	-2	-21%
Emergency Medicine	5	24%	2	8%
General Surgery	-3	-14%	-6	-25%
Ophthalmology	-1	-20%	-1	-30%
Otolaryngology	0	4%	0	-9%
Orthopedic Surgery	-2	-13%	-4	-24%
Urology	-1	-11%	-1	-23%
Other Surgical Specialties	0	--	0	--

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 14 physicians in the Northeast region. Demand for primary care physicians was forecast to grow by 8 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 6 more physicians than the supply. The specialties forecast to experience the greatest shortage expressed as a percentage of demand was Cardiology and Ophthalmology, with shortages projected to exceed 20 percent. However, with the exception of General/Family Medicine, the shortages seldom were forecast to exceed 1 FTE physician.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 45 physicians in the region. Demand for primary care physicians was forecast to grow by 18 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 24 more physicians than the supply. The specialties forecast to experience the greatest shortages were General/Family Medicine and General Surgery, with shortages projected to exceed 5 FTE physicians.

Figure 190 – Projected Difference Between Physician Supply and Demand in the Northwest Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-165**	**-15%**	**-295**	**-24%**
Primary Care	*-61*	*-14%*	*-91*	*-20%*
General/Family Medicine	-43	-16%	-61	-22%
General Internal Medicine	-19	-14%	-28	-19%
General Pediatrics	1	2%	-2	-5%
Non-Primary Care	*-104*	*-16%*	*-204*	*-27%*
Cardiovascular Diseases	-11	-33%	-16	-42%
Other Internal Medicine Subspecialties	-10	-13%	-22	-25%
Obstetrics and Gynecology	-1	-3%	-8	-15%
Pathology	-9	-31%	-13	-40%
Psychiatry	-8	-18%	-14	-28%
Anesthesiology	-7	-11%	-17	-23%
Radiology	-9	-18%	-17	-29%
Emergency Medicine	7	11%	-2	-3%
General Surgery	-15	-23%	-24	-33%
Ophthalmology	-9	-27%	-14	-37%
Otolaryngology	-4	-25%	-6	-35%
Orthopedic Surgery	-10	-23%	-17	-33%
Urology	-3	-20%	-5	-30%
Other Surgical Specialties	-6	-24%	-10	-34%

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 165 physicians in the Northwest region. Demand for primary care physicians was forecast to grow by 61 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 104 more physicians than the supply. Every specialty except General Pediatrics and Emergency Medicine was forecast to experience a shortage in 2020. The specialties forecast to experience the greatest shortage expressed as a percentage of demand was Cardiology and Ophthalmology, with shortages projected to exceed 30 percent. The shortages forecast for primary care physicians were among the greatest in the state.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 295 physicians in the region. Demand for primary care physicians was forecast to grow by 91 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 204 more physicians than the supply. The specialties forecast to experience the greatest shortages were Cardiology, Pathology, Ophthalmology, and Otolaryngology, with projected shortages exceeding 35 percent.

Figure 191 – Projected Difference Between Physician Supply and Demand in Saginaw-Thumb Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**0**	**0%**	**-194**	**-10%**
Primary Care	*-2*	*0%*	*-50*	*-7%*
General/Family Medicine	-11	-2%	-41	-9%
General Internal Medicine	2	1%	-12	-5%
General Pediatrics	7	13%	3	6%
Non-Primary Care	*2*	*0%*	*-144*	*-13%*
Cardiovascular Diseases	-12	-23%	-20	-33%
Other Internal Medicine Subspecialties	4	3%	-13	-10%
Obstetrics and Gynecology	10	13%	-2	-2%
Pathology	-4	-15%	-8	-26%
Psychiatry	-2	-3%	-9	-16%
Anesthesiology	3	4%	-9	-10%
Radiology	-4	-4%	-17	-17%
Emergency Medicine	33	31%	17	14%
General Surgery	-9	-9%	-23	-21%
Ophthalmology	-8	-18%	-14	-28%
Otolaryngology	0	-2%	-4	-15%
Orthopedic Surgery	-5	-9%	-13	-21%
Urology	-3	-10%	-7	-22%
Other Surgical Specialties	-3	-12%	-8	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the supply of physicians was forecast to grow about the same as demand in the Saginaw-Thumb region. The demand for primary care physicians was forecast to grow by 2 more physicians than supply, while the supply for non-primary care physicians was forecast to grow by 2 more physicians than demand. A number of specialties, however, were forecast to experience shortages, including Cardiology, Pathology, Psychiatry, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other surgical specialties. The forecast shortages were most acute in Cardiology, Pathology, and Ophthalmology, with shortages projected to exceed 15 percent.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 194 physicians in the region. Demand for primary care physicians was forecast to grow by 50 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 144 more physicians than the supply. The specialties forecast to experience the greatest shortages expressed as a percentage of demand were Cardiology, Pathology, General Surgery, Ophthalmology, Otolaryngology, Urology, and other surgical specialties, with shortages projected to exceed 20 percent.

Figure 192 – Projected Difference Between Physician Supply and Demand in Southwest Michigan in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**16**	**4%**	**-30**	**-7%**
Primary Care	*8*	*4%*	*-5*	*-2%*
General/Family Medicine	2	2%	-6	-5%
General Internal Medicine	4	7%	0	0%
General Pediatrics	2	9%	0	2%
Non-Primary Care	*8*	*4%*	*-25*	*-10%*
Cardiovascular Diseases	-2	-14%	-4	-26%
Other Internal Medicine Subspecialties	3	8%	-3	-6%
Obstetrics and Gynecology	4	15%	0	0%
Pathology	-1	-11%	-2	-22%
Psychiatry	0	1%	-1	-12%
Anesthesiology	2	8%	-1	-6%
Radiology	0	1%	-3	-12%
Emergency Medicine	5	32%	3	15%
General Surgery	-2	-6%	-6	-18%
Ophthalmology	-1	-10%	-2	-22%
Otolaryngology	0	4%	-1	-9%
Orthopedic Surgery	0	-4%	-2	-17%
Urology	0	-3%	-1	-16%
Other Surgical Specialties	-1	-8%	-2	-20%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the supply of physicians was forecast to outpace demand by 16 physicians in the Southwest Michigan region. The supply of primary care physicians was forecast to grow by 8 more physicians than demand, and the supply of non-primary care physicians was forecast to grow by 8 more physicians than demand. However, a number of specialties were forecast to experience shortages including, Cardiology, Pathology, and Ophthalmology. Moreover, in a number of specialties, the differences between supply and demand were not forecast to reach 1 FTE physician.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 30 physicians in the region. Demand for primary care physicians was forecast to grow by 5 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 25 more physicians than the supply. The specialties forecast to experience the greatest shortages were General/Family Medicine and General Surgery, with shortages projected to exceed 5 FTE physicians.

Figure 193 – Projected Difference Between Physician Supply and Demand in the Upper Peninsula in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**6**	**1%**	**-78**	**-9%**
Primary Care	*5*	*2%*	*-19*	*-5%*
General/Family Medicine	-1	0%	-18	-7%
General Internal Medicine	2	3%	-3	-4%
General Pediatrics	4	16%	2	9%
Non-Primary Care	*1*	*0%*	*-59*	*-13%*
Cardiovascular Diseases	-3	-23%	-6	-33%
Other Internal Medicine Subspecialties	2	3%	-7	-10%
Obstetrics and Gynecology	5	17%	1	2%
Pathology	-3	-15%	-5	-26%
Psychiatry	0	-2%	-4	-15%
Anesthesiology	1	4%	-3	-10%
Radiology	-1	-2%	-6	-15%
Emergency Medicine	9	29%	4	12%
General Surgery	-4	-10%	-11	-22%
Ophthalmology	-2	-13%	-5	-24%
Otolaryngology	-1	-9%	-2	-21%
Orthopedic Surgery	-1	-7%	-4	-19%
Urology	-1	-16%	-3	-27%
Other Surgical Specialties	-1	-11%	-2	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the supply of physicians was forecast to outpace demand by 6 physicians in the Upper Peninsula region. The supply of primary care physicians was forecast to grow by 5 more physicians than demand, and the supply of non-primary care physicians was forecast to grow by 1 more physicians than demand. However, many specialties were forecast to experience shortages including, General/Family Medicine, Cardiology, Pathology, Radiology, General Surgery, Ophthalmology, Otolaryngology, Orthopedic Surgery, Urology, and other surgical specialties. It should be noted that in a number of specialties, the differences between supply and demand were not forecast to exceed 1 FTE physician – Cardiology, Pathology, and General Surgery were exceptions.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 78 physicians in the region. Demand for primary care physicians was forecast to grow by 19 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 59 more physicians than the supply. Although shortages were projected in all but a few specialties, the specialties forecast to experience the greatest shortages were General/Family Medicine and General Surgery, with shortages projected to exceed 10 FTE physicians.

Figure 194 – Projected Difference Between Physician Supply and Demand in the West Central Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-28**	**-5%**	**-88**	**-14%**
Primary Care	*-15*	*-5%*	*-35*	*-11%*
General/Family Medicine	-13	-7%	-27	-13%
General Internal Medicine	-2	-3%	-7	-9%
General Pediatrics	0	2%	-1	-5%
Non-Primary Care	*-13*	*-5%*	*-53*	*-17%*
Cardiovascular Diseases	-4	-27%	-6	-37%
Other Internal Medicine Subspecialties	0	-1%	-5	-14%
Obstetrics and Gynecology	1	5%	-3	-9%
Pathology	-2	-20%	-3	-30%
Psychiatry	-2	-12%	-4	-24%
Anesthesiology	0	-2%	-3	-15%
Radiology	-2	-8%	-5	-20%
Emergency Medicine	6	21%	2	5%
General Surgery	-5	-13%	-11	-25%
Ophthalmology	-1	-17%	-2	-28%
Otolaryngology	0	-9%	-1	-21%
Orthopedic Surgery	-2	-10%	-5	-22%
Urology	-1	-10%	-2	-22%
Other Surgical Specialties	0	-11%	0	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

In the Demographic Only scenario, the demand for physicians was forecast to outpace supply by 28 physicians in the West Central region. Demand for primary care physicians was forecast to grow by 15 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 13 more physicians than the supply. The specialties forecast to experience the greatest shortage expressed as a percentage of demand was Cardiology and Pathology, with shortages projected to exceed 20 percent. However, with the exception of General/Family Medicine, Cardiology, and General Surgery, the shortages seldom were forecast to exceed 2 FTE physicians.

In the Trend scenario, the demand for physicians was forecast to outpace supply by 88 physicians in the region. Demand for primary care physicians was forecast to grow by 35 more physicians than the supply, while demand for non-primary care physicians was forecast to grow by 53 more physicians than the supply. The specialties forecast to experience the greatest shortages were General/Family Medicine and General Surgery, with shortages projected to exceed 10 FTE physicians.

Regional Supply Scenario 2: Baseline Supply Responsive to Demand

As mentioned above, in this regional supply scenario, the relationship between supply and demand was projected to be the same across all regions where the supply of physicians was assumed to be responsive to regional demand changes. The predicted shortages in every region was approximately the same as the state level shortage predicted using the baseline supply forecast and the Demographic Only and Trend demand scenarios. Any differences reported were trivial and due to rounding, rather than real differences across regions.

In the Demographic Only scenario, demand for physicians was projected to grow at a faster rate than the supply of physicians. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 1 percent in 2020. The size of the shortage was projected to range between 1 physician in the East Central region and 175 physicians in the Detroit Area region.

Figure 195 – Projected Difference Between Physician Supply and Demand in the Ann Arbor Area in 2020

	Demographic Only Scenario		**Trend Scenario**	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-67**	**-1%**	**-650**	**-13%**
Primary Care	*8*	*1%*	*-78*	*-6%*
General/Family Medicine	-11	-4%	-31	-10%
General Internal Medicine	9	1%	-41	-5%
General Pediatrics	10	4%	-6	-2%
Non-Primary Care	*-74*	*-2%*	*-572*	*-15%*
Cardiovascular Diseases	-30	-23%	-50	-33%
Other Internal Medicine Subspecialties	16	2%	-92	-11%
Obstetrics and Gynecology	13	8%	-12	-6%
Pathology	-25	-16%	-47	-27%
Psychiatry	-17	-7%	-57	-19%
Anesthesiology	4	2%	-32	-12%
Radiology	-8	-4%	-40	-16%
Emergency Medicine	44	25%	17	8%
General Surgery	-26	-11%	-62	-22%
Ophthalmology	-14	-16%	-28	-27%
Otolaryngology	-3	-5%	-11	-18%
Orthopedic Surgery	-10	-9%	-27	-21%
Urology	-8	-12%	-18	-23%
Other Surgical Specialties	-14	-12%	-33	-23%

In the Trend scenario, demand for physicians was also projected to grow at a faster rate than the supply of physicians. Expressed as a percentage of the number of physicians required to meet the demand for their services, the shortage predicted in the Trend Scenario amounted to 12 percent

in 2020. The size of the shortage was projected to range between 19 physician in the East Central region and 2,025 physicians in the Detroit Area region.

In terms of specialty-specific forecasts, the relationship between supply and demand at the regional level once again was equivalent to the relationship at the state level.

Figure 196 – Projected Difference Between Physician Supply and Demand in the Detroit Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-175**	**-1%**	**-2,025**	**-12%**
Primary Care	*-3*	*0%*	*-397*	*-6%*
General/Family Medicine	-77	-4%	-217	-10%
General Internal Medicine	35	1%	-157	-5%
General Pediatrics	40	4%	-24	-2%
Non-Primary Care	*-173*	*-2%*	*-1,628*	*-15%*
Cardiovascular Diseases	-95	-23%	-158	-33%
Other Internal Medicine Subspecialties	37	2%	-208	-11%
Obstetrics and Gynecology	68	8%	-63	-6%
Pathology	-66	-16%	-125	-27%
Psychiatry	-44	-7%	-145	-19%
Anesthesiology	10	2%	-83	-12%
Radiology	-29	-4%	-140	-16%
Emergency Medicine	188	25%	74	8%
General Surgery	-92	-11%	-223	-22%
Ophthalmology	-61	-16%	-118	-27%
Otolaryngology	-8	-5%	-30	-18%
Orthopedic Surgery	-34	-9%	-92	-21%
Urology	-23	-12%	-54	-23%
Other Surgical Specialties	-34	-12%	-77	-23%

Figure 197 – Projected Difference Between Physician Supply and Demand in the East Central Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-1**	**-1%**	**-19**	**-10%**
Primary Care	*-2*	*-2%*	*-9*	*-8%*
General/Family Medicine	-2	-4%	-7	-10%
General Internal Medicine	0	1%	-2	-5%
General Pediatrics	0	4%	0	-2%
Non-Primary Care	*1*	*1%*	*-10*	*-12%*
Cardiovascular Diseases	0	-23%	0	-33%
Other Internal Medicine Subspecialties	0	2%	-2	-11%
Obstetrics and Gynecology	1	8%	-1	-6%
Pathology	-1	-16%	-1	-27%
Psychiatry	0	-7%	-1	-19%
Anesthesiology	0	2%	0	-12%
Radiology	0	-4%	0	-16%
Emergency Medicine	3	25%	1	8%
General Surgery	-1	-11%	-3	-22%
Ophthalmology	0	-16%	-1	-27%
Otolaryngology	0	-5%	-1	-18%
Orthopedic Surgery	0	--	0	--
Urology	0	-12%	0	-23%
Other Surgical Specialties	0	-12%	0	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

Figure 198 – Projected Difference Between Physician Supply and Demand in the Flint Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-21**	**-1%**	**-179**	**-11%**
Primary Care	*-7*	*-1%*	*-60*	*-7%*
General/Family Medicine	-15	-4%	-41	-10%
General Internal Medicine	4	1%	-17	-5%
General Pediatrics	3	4%	-2	-2%
Non-Primary Care	*-13*	*-2%*	*-119*	*-15%*
Cardiovascular Diseases	-7	-23%	-12	-33%
Other Internal Medicine Subspecialties	3	2%	-17	-11%
Obstetrics and Gynecology	6	8%	-5	-6%
Pathology	-4	-16%	-8	-27%
Psychiatry	-2	-7%	-7	-19%
Anesthesiology	1	2%	-7	-12%
Radiology	-3	-4%	-16	-16%
Emergency Medicine	12	25%	5	8%
General Surgery	-7	-11%	-17	-22%
Ophthalmology	-3	-16%	-6	-27%
Otolaryngology	-1	-5%	-2	-18%
Orthopedic Surgery	-3	-9%	-9	-21%
Urology	-1	-12%	-3	-23%
Other Surgical Specialties	-3	-12%	-6	-23%

Figure 199 – Projected Difference Between Physician Supply and Demand in the Grand Rapids-Muskegon Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-31**	**-1%**	**-422**	**-11%**
Primary Care	*-12*	*-1%*	*-96*	*-7%*
General/Family Medicine	-24	-4%	-68	-10%
General Internal Medicine	5	1%	-23	-5%
General Pediatrics	8	4%	-5	-2%
Non-Primary Care	*-19*	*-1%*	*-326*	*-14%*
Cardiovascular Diseases	-13	-23%	-22	-33%
Other Internal Medicine Subspecialties	6	2%	-35	-11%
Obstetrics and Gynecology	16	8%	-14	-6%
Pathology	-11	-16%	-21	-27%
Psychiatry	-6	-7%	-21	-19%
Anesthesiology	3	2%	-26	-12%
Radiology	-6	-4%	-30	-16%
Emergency Medicine	55	25%	22	8%
General Surgery	-21	-11%	-52	-22%
Ophthalmology	-12	-16%	-24	-27%
Otolaryngology	-2	-5%	-7	-18%
Orthopedic Surgery	-13	-9%	-33	-21%
Urology	-5	-12%	-13	-23%
Other Surgical Specialties	-10	-12%	-23	-23%

Figure 200 – Projected Difference Between Physician Supply and Demand in the Jackson Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-12**	**-2%**	**-90**	**-12%**
Primary Care	*-3*	*-1%*	*-22*	*-7%*
General/Family Medicine	-6	-4%	-16	-10%
General Internal Medicine	1	1%	-5	-5%
General Pediatrics	2	4%	-1	-2%
Non-Primary Care	*-9*	*-2%*	*-68*	*-15%*
Cardiovascular Diseases	-5	-23%	-8	-33%
Other Internal Medicine Subspecialties	1	2%	-8	-11%
Obstetrics and Gynecology	2	8%	-2	-6%
Pathology	-2	-16%	-4	-27%
Psychiatry	-2	-7%	-7	-19%
Anesthesiology	1	2%	-5	-12%
Radiology	-1	-4%	-5	-16%
Emergency Medicine	8	25%	3	8%
General Surgery	-4	-11%	-9	-22%
Ophthalmology	-3	-16%	-7	-27%
Otolaryngology	-1	-5%	-2	-18%
Orthopedic Surgery	-2	-9%	-5	-21%
Urology	-1	-12%	-2	-23%
Other Surgical Specialties	-1	-12%	-1	-23%

Figure 201 – Projected Difference Between Physician Supply and Demand in Kalamazoo-Battle Creek Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-11**	**-1%**	**-207**	**-11%**
Primary Care	*-3*	*0%*	*-45*	*-7%*
General/Family Medicine	-10	-4%	-29	-10%
General Internal Medicine	3	1%	-13	-5%
General Pediatrics	4	4%	-3	-2%
Non-Primary Care	*-8*	*-1%*	*-163*	*-14%*
Cardiovascular Diseases	-10	-23%	-17	-33%
Other Internal Medicine Subspecialties	4	2%	-21	-11%
Obstetrics and Gynecology	5	8%	-5	-6%
Pathology	-5	-16%	-9	-27%
Psychiatry	-7	-7%	-23	-19%
Anesthesiology	1	2%	-8	-12%
Radiology	-2	-4%	-11	-16%
Emergency Medicine	33	25%	13	8%
General Surgery	-10	-11%	-23	-22%
Ophthalmology	-5	-16%	-11	-27%
Otolaryngology	-1	-5%	-4	-18%
Orthopedic Surgery	-6	-9%	-16	-21%
Urology	-2	-12%	-5	-23%
Other Surgical Specialties	-4	-12%	-8	-23%

Figure 202 – Projected Difference Between Physician Supply and Demand in the Lansing Area in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-19**	**-1%**	**-219**	**-11%**
Primary Care	*-7*	*-1%*	*-55*	*-7%*
General/Family Medicine	-14	-4%	-40	-10%
General Internal Medicine	3	1%	-12	-5%
General Pediatrics	5	4%	-3	-2%
Non-Primary Care	*-12*	*-1%*	*-164*	*-14%*
Cardiovascular Diseases	-13	-23%	-21	-33%
Other Internal Medicine Subspecialties	3	2%	-18	-11%
Obstetrics and Gynecology	6	8%	-6	-6%
Pathology	-4	-16%	-8	-27%
Psychiatry	-7	-7%	-22	-19%
Anesthesiology	1	2%	-10	-12%
Radiology	-2	-4%	-12	-16%
Emergency Medicine	25	25%	10	8%
General Surgery	-8	-11%	-21	-22%
Ophthalmology	-5	-16%	-10	-27%
Otolaryngology	-1	-5%	-2	-18%
Orthopedic Surgery	-4	-9%	-10	-21%
Urology	-2	-12%	-5	-23%
Other Surgical Specialties	-3	-12%	-8	-23%

Figure 203 – Projected Difference Between Physician Supply and Demand in the Northeast Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-3**	**-1%**	**-34**	**-11%**
Primary Care	*-3*	*-2%*	*-12*	*-8%*
General/Family Medicine	-3	-4%	-10	-10%
General Internal Medicine	1	1%	-2	-5%
General Pediatrics	0	4%	0	-2%
Non-Primary Care	*-1*	*-1%*	*-22*	*-14%*
Cardiovascular Diseases	-1	-23%	-1	-33%
Other Internal Medicine Subspecialties	0	2%	-2	-11%
Obstetrics and Gynecology	1	8%	-1	-6%
Pathology	-1	-16%	-2	-27%
Psychiatry	0	-7%	-1	-19%
Anesthesiology	0	2%	-2	-12%
Radiology	0	-4%	-2	-16%
Emergency Medicine	5	25%	2	8%
General Surgery	-2	-11%	-5	-22%
Ophthalmology	0	-16%	-1	-27%
Otolaryngology	0	-5%	0	-18%
Orthopedic Surgery	-1	-9%	-4	-21%
Urology	-1	-12%	-1	-23%
Other Surgical Specialties	0	--	0	--

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

Figure 204 – Projected Difference Between Physician Supply and Demand in the Northwest Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-24**	**-2%**	**-153**	**-12%**
Primary Care	*-7*	*-2%*	*-36*	*-8%*
General/Family Medicine	-10	-4%	-27	-10%
General Internal Medicine	2	1%	-8	-5%
General Pediatrics	1	4%	-1	-2%
Non-Primary Care	*-17*	*-3%*	*-117*	*-15%*
Cardiovascular Diseases	-7	-23%	-12	-33%
Other Internal Medicine Subspecialties	2	2%	-10	-11%
Obstetrics and Gynecology	4	8%	-3	-6%
Pathology	-5	-16%	-9	-27%
Psychiatry	-3	-7%	-9	-19%
Anesthesiology	1	2%	-9	-12%
Radiology	-2	-4%	-9	-16%
Emergency Medicine	15	25%	6	8%
General Surgery	-7	-11%	-16	-22%
Ophthalmology	-5	-16%	-11	-27%
Otolaryngology	-1	-5%	-3	-18%
Orthopedic Surgery	-4	-9%	-11	-21%
Urology	-2	-12%	-4	-23%
Other Surgical Specialties	-3	-12%	-7	-23%

Figure 205 – Projected Difference Between Physician Supply and Demand in Saginaw-Thumb Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-27**	**-2%**	**-222**	**-12%**
Primary Care	*-12*	*-2%*	*-60*	*-8%*
General/Family Medicine	-17	-4%	-47	-10%
General Internal Medicine	3	1%	-12	-5%
General Pediatrics	2	4%	-1	-2%
Non-Primary Care	*-15*	*-2%*	*-161*	*-14%*
Cardiovascular Diseases	-12	-23%	-20	-33%
Other Internal Medicine Subspecialties	3	2%	-14	-11%
Obstetrics and Gynecology	6	8%	-5	-6%
Pathology	-4	-16%	-8	-27%
Psychiatry	-3	-7%	-11	-19%
Anesthesiology	1	2%	-11	-12%
Radiology	-4	-4%	-17	-16%
Emergency Medicine	27	25%	10	8%
General Surgery	-10	-11%	-24	-22%
Ophthalmology	-7	-16%	-13	-27%
Otolaryngology	-1	-5%	-4	-18%
Orthopedic Surgery	-5	-9%	-13	-21%
Urology	-3	-12%	-7	-23%
Other Surgical Specialties	-3	-12%	-8	-23%

Figure 206 – Projected Difference Between Physician Supply and Demand in Southwest Michigan in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-8**	**-2%**	**-55**	**-12%**
Primary Care	*-2*	*-1%*	*-16*	*-8%*
General/Family Medicine	-4	-4%	-12	-10%
General Internal Medicine	1	1%	-3	-5%
General Pediatrics	1	4%	-1	-2%
Non-Primary Care	*-6*	*-3%*	*-39*	*-15%*
Cardiovascular Diseases	-3	-23%	-6	-33%
Other Internal Medicine Subspecialties	1	2%	-5	-11%
Obstetrics and Gynecology	2	8%	-2	-6%
Pathology	-1	-16%	-2	-27%
Psychiatry	-1	-7%	-2	-19%
Anesthesiology	0	2%	-3	-12%
Radiology	-1	-4%	-4	-16%
Emergency Medicine	4	25%	2	8%
General Surgery	-3	-11%	-7	-22%
Ophthalmology	-1	-16%	-3	-27%
Otolaryngology	0	-5%	-1	-18%
Orthopedic Surgery	-1	-9%	-2	-21%
Urology	-1	-12%	-1	-23%
Other Surgical Specialties	-1	-12%	-2	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

Figure 207 – Projected Difference Between Physician Supply and Demand in the Upper Peninsula in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-16**	**-2%**	**-101**	**-12%**
Primary Care	*-8*	*-2%*	*-32*	*-8%*
General/Family Medicine	-10	-4%	-27	-10%
General Internal Medicine	1	1%	-4	-5%
General Pediatrics	1	4%	-1	-2%
Non-Primary Care	*-9*	*-2%*	*-69*	*-15%*
Cardiovascular Diseases	-3	-23%	-6	-33%
Other Internal Medicine Subspecialties	1	2%	-8	-11%
Obstetrics and Gynecology	2	8%	-2	-6%
Pathology	-3	-16%	-6	-27%
Psychiatry	-2	-7%	-6	-19%
Anesthesiology	0	2%	-3	-12%
Radiology	-1	-4%	-6	-16%
Emergency Medicine	8	25%	3	8%
General Surgery	-5	-11%	-11	-22%
Ophthalmology	-3	-16%	-6	-27%
Otolaryngology	-1	-5%	-2	-18%
Orthopedic Surgery	-2	-9%	-5	-21%
Urology	-1	-12%	-2	-23%
Other Surgical Specialties	-1	-12%	-3	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

Figure 208 – Projected Difference Between Physician Supply and Demand in the West Central Region in 2020

	Demographic Only Scenario		Trend Scenario	
	Projected Difference in 2020	*Projected Difference as a Percent of Demand in 2020*	*Projected Difference in 2020*	*Projected Difference as a Percent of Demand in 2020*
All Physicians	**-10**	**-2%**	**-69**	**-11%**
Primary Care	*-6*	*-2%*	*-25*	*-8%*
General/Family Medicine	-7	-4%	-20	-10%
General Internal Medicine	1	1%	-4	-5%
General Pediatrics	1	4%	0	-2%
Non-Primary Care	*-4*	*-2%*	*-45*	*-14%*
Cardiovascular Diseases	-3	-23%	-5	-33%
Other Internal Medicine Subspecialties	1	2%	-4	-11%
Obstetrics and Gynecology	2	8%	-2	-6%
Pathology	-2	-16%	-3	-27%
Psychiatry	-1	-7%	-3	-19%
Anesthesiology	0	2%	-2	-12%
Radiology	-1	-4%	-4	-16%
Emergency Medicine	7	25%	3	8%
General Surgery	-4	-11%	-10	-22%
Ophthalmology	-1	-16%	-2	-27%
Otolaryngology	0	-5%	-1	-18%
Orthopedic Surgery	-2	-9%	-4	-21%
Urology	-1	-12%	-2	-23%
Other Surgical Specialties	0	-12%	0	-23%

Note: Where the difference between supply and demand is reported as 0, but a percent is indicated, the actual projected difference was a fraction of an FTE physician below 0.5.

Chapter 10: Limitations

The findings presented in this summary are subject to a number of limitations that should be considered prior to developing policy based upon them. In general, as with all forecasting endeavors, the forecasts of physician supply and demand presented here were constructed on a foundation of assumptions. These assumptions are associated with the factors that determine physician supply and demand (e.g., number of new entrants into the Michigan physician workforce; age-, gender-, location-, insurance status-specific physician utilization rates; estimated elasticities of physician demand to economic growth/decline; and so forth). To the extent these assumptions fail to hold over the forecast period, the accuracy of the forecasts will suffer. However, the assumptions made were based upon historical data and, where available, Michigan-specific data. Moreover, the construction of multiple scenarios that allow for variation in some of the key assumptions of the forecasting models mitigates the risk of inaccuracy due to ill-chosen assumptions.

Another way to treat the forecasts in this report is to think of them as illustrative of what the future might hold under a specific set of conditions. For example, in one of the demand scenarios developed for this report, it was assumed that all of the unnecessary services provided by physicians would be eliminated by 2020. How likely is it that the health care system will change enough for this assumption to be true? It is not likely at all. However, the scenarios developed with this assumption do illustrate the effect on demand for physicians in such an environment. Thus, one could use this information to know what the effect might be should one-fifth or one-quarter of these services are eliminated. The same could be said for any of the assumptions made in these forecasts.

The findings presented here also do not take into account the potential feedback effects resulting from the predicted national physician shortage or the predicted physician shortage in Michigan. For example, the predicted shortage of Cardiologists nationally may influence young physicians to select Cardiology as a practice specialty at a higher rate than the forecast models assume. Moreover, in response to a widespread shortage of physicians, current practitioners may delay retirement. Further, if demand for physicians were to decrease as sharply as the scenarios in which unnecessary services were eliminated, it is likely that supply would respond by growing at a slower same rate than forecast, reducing the imbalances suggested by the models. There is a nearly infinite list of other potential feedback effects in response to physician shortages that could affect supply and demand in the future.

Similarly, the findings presented in this summary do not take into account any policy changes that might be wrought as a result of the publication of the findings. While national policies around the physician workforce do not appear to have been affected by the COGME's *Sixteenth Report* as yet, state level initiatives have begun to respond to the predicted shortage of physicians. With a shortage looming, it is likely that competition for physicians among states will increase. In the way states now compete feverishly for new businesses and their accompanying jobs, it will not be surprising if states act similarly with regard to physicians. The nature of this competition is likely to have ramifications for the relationship between physician supply and demand that cannot be accounted for in the current forecasting models.

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Appendix

The regions used throughout this report consisted of the following counties:

Region Name	County Components
Ann Arbor Area	Livingston, Washtenaw
Detroit Area	Macomb, Oakland, St. Clair, Wayne
East Central	Arenac, Clare, Gladwin, Iosco, Ogemaw, Roscommon
Flint Area	Genesee, Shiawassee
Grand Rapids-Muskegon	Allegan, Kent, Muskegon, Oceana, Ottawa
Jackson Area	Hillsdale, Jackson, Lenawee, Monroe
Kalamazoo-Battle Creek	Barry, Branch, Calhoun, Kalamazoo, St. Joseph
Lansing Area	Clinton, Eaton, Ingham
Northeast	Alcona, Alpena, Cheboygan, Crawford, Montmorency, Oscoda, Ostego, Presque Isle
Northwest	Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee, Wexford
Saginaw-Thumb	Bay, Huron, Lapeer, Midland, Saginaw, Sanilac, Tuscola
Southwest Michigan	Berrien, Cass, Van Buren
Upper Peninsula	Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft
West Central	Gratiot, Ionia, Isabella, Lake, Mason, Mecosta, Montcalm, Newaygo, Osceola

In Chapter 4, the following specialty grouping was used:

Chapter 4 Specialty Grouping	***American Medical Association Specialty***
Allergy & Immunology	Allergy; Allergy & Immunology; Allergy & Immunology / Clinical Laboratory Immunology; Immunology
Anesthesiology	Anesthesiology; Critical Care Medicine (Anesthesiology); Pediatric Anesthesiology
Cardiology	Cardiovascular Disease
Dermatology	Dermatology; Dermatologic Surgery
Emergency Medicine	Emergency Medicine; Medical Toxicology (Emergency Medicine); Pediatric Emergency Medicine (Emergency Medicine)
Endocrinology and Metabolism	Endocrinology, Diabetes & Metabolism
Family Medicine	Family Medicine; Geriatric Medicine (Family Medicine); Sports Medicine (Family Medicine); General Practice
Gastroenterology	Gastroenterology
Geriatrics	Geriatric Medicine (Internal Medicine)
Gynecology (Only)	Gynecology
Infectious Disease	Infectious Disease
Internal Medicine (General)	Internal Medicine
Medical Oncology	Medical Oncology
Nephrology	Nephrology
Neurology	Child Neurology; Clinical Neurophysiology; Neurology

Chapter 4 Specialty Grouping	*American Medical Association Specialty*
Neurosurgery	Neurological Surgery; Pediatric Surgery (Neurology)
Obstetrics & Gynecology	Gynecological Oncology; Maternal & Fetal Medicine; Obstetrics & Gynecology; Obstetrics; Reproductive Endocrinology
Ophthalmology	Ophthalmology; Pediatric Ophthalmology
Orthopedics	Hand Surgery (Orthopedic Surgery); Adult Reconstructive Orthopedics; Orthopedics, Foot & Ankle; Osteopathic Manipulative Medicine; Musculoskeletal Oncology; Pediatric Orthopedics; Orthopedic Surgery; Sports Medicine (Orthopedic Surgery); Orthopedic Surgery of the Spine; Orthopedic Trauma
Other Internal Medicine Specialties	Clinical & Laboratory Immunology (Internal Medicine); Critical Care Medicine (Internal Medicine); Diabetes; Hematology; Hepatology; Hematology/Oncology; Interventional Cardiology; Cardiac Electrophysiology; Internal Medicine/Emergency Medicine; Nutrition
Other Specialties	Addiction Medicine; Adolescent Medicine (Internal Medicine); Aerospace Medicine; Clinical Genetics; Clinical Molecular Genetics; Internal Medicine/Physical Medicine &Rehabilitation; Legal Medicine; Medical Management; Medical Genetics; Other Specialty; Clinical Pharmacology; Pharmaceutical Medicine; Palliative Medicine; Pain Management; Pain Medicine; Sleep Medicine; Urgent Care Medicine; Vascular Medicine
Other Surgery Specialties	Abdominal Surgery; Surgical Critical Care (Surgery); Colon & Rectal Surgery; Head & Neck Surgery; Hand Surgery; Pediatric Cardiothoracic Surgery; Pediatric Surgery (Surgery); Surgical Oncology; Trauma Surgery; Transplant Surgery; Vascular Surgery

Chapter 4 Specialty Grouping	*American Medical Association Specialty*
Otolaryngology	Oral and Maxillofacial Surgery; Otology/Neurotology; Otolaryngology; Pediatric Otolaryngology
Pathology	Anatomic Pathology; Blood Banking Transfusion Medicine; Clinical Pathology; Dermatopathology; Forensic Pathology; Hematology (Pathology); Medical Microbiology; Neuropathology; Chemical Pathology; Cytopathology; Pediatric Pathology; Anatomic/Clinical Pathology; Selective Pathology
Pediatrics Subspecialties	Pediatric Critical Care Medicine; Pediatrics/Emergency Medicine; Internal Medicine/Pediatrics; Neonatal-Perinatal Medicine; Pediatric Allergy; Pediatric Cardiology; Pediatric Endocrinology; Pediatric Infectious Disease; Pediatric Pulmonology; Pediatric Emergency Medicine (Pediatrics); Pediatric Gastroenterlogy; Pediatric Hematology/Oncology; Pediatric Nephrology; Pediatric Rheumatology; Sports Medicine (Pediatrics)
Pediatrics (General)	Adolescent Medicine; Pediatrics
Physical Medicine & Rehab	Physical Medicine & Rehabilitation; Spinal Cord Injury
Plastic Surgery	Cosmetic Surgery; Facial Plastic Surgery; Plastic Surgery;
Prev Med/Occ Med/Public Hlth	General Preventive Medicine; Occupational Medicine; Public Health and General Preventive Medicine
Psychiatry-Adult	Addiction Psychiatry; Internal Medicine (Psychiatry); Neurodevelopmental Disabilities (Psychiatry & Neurology); Psychiatry; Forensic Psychiatry; Psychoanalysis; Geriatric Psychiatry
Psychiatry-Child & Adolescent	Child & Adolescent Psychiatry

Chapter 4 Specialty Grouping	*American Medical Association Specialty*
Pulmonary Disease	Pulmonary Critical Care Medicine; Pulmonary Disease
Radiology	Abdominal Radiology; Diagnostic Radiology; Musculoskeletal Radiology; Nuclear Medicine; Nuclear Radiology; Pediatric Radiology; Radiology; Neuroradiology; Radiation Oncology; Vascular & Interventional Radiology
Rheumatology	Rheumatology
Surgery (General)	General Surgery
Thoracic Surgery	Thoracic Surgery
Urology	Urology; Pediatric Urology

For the physician supply and demand forecasting sections of the report, the following specialty grouping was used:

Forecasting Specialty Grouping	***American Medical Association Specialty***
Family Medicine	General Practice; Family Medicine / Psychiatry; Geriatric Medicine (Family Medicine); Family Medicine; Sports Medicine (Family Medicine)
General Internal Medicine	Internal Medicine
General Pediatrics	Pediatrics
Cardiovascular Disease	Cardiovascular Disease
(Other) Internal Medicine Subspecialties	Allergy; Allergy and Immunology; Clinical and Laboratory Immunology (Allergy and Immunology); Immunology; Gastroenterology; Diabetes; Clinical and Laboratory Immunology (Internal Medicine); Rheumatology; Endocrinology, Diabetes, and Metabolism; Sports Medicine (Internal Medicine); Nephrology; Medical Oncology; Nutrition; Internal Medicine / Physical Medicine and Rehabilitation; Internal Medicine / Psychiatry; Internal Medicine / Neurology; Internal Medicine (Preventive Medicine); Geriatric Medicine (Internal Medicine); Internal Medicine / Family Practice; Infectious Disease; Interventional Cardiology; Hospitalist; Hematology / Oncology; Hepatology; Adolescent Medicine (Internal Medicine); Clinical Cardiac Electrophysiology; Hematology (Internal Medicine); Pediatric Critical Care Medicine; Pediatric Rheumatology; Pediatric Allergy; Pediatric Endocrinology; Pediatric Hematology / Oncology; Pediatric Nephrology; Pediatric Psychiatry / Child Psychiatry; Pediatric Pulmonology; Adolescent Medicine (Pediatrics); Sports Medicine (Pediatrics); Pediatrics Rehabilitation Medicine; Clinical and Laboratory Immunology (Pediatrics);

Forecasting Specialty Grouping	*American Medical Association Specialty*
(Other) Internal Medicine Subspecialties (cont.)	Pediatric Gastroenterology; Medical Toxicology (Pediatrics); Developmental-Behavioral Pediatrics; Pediatrics Infectious Disease; Pediatric Anesthesiology; Neonatal-Perinatal Medicine; Internal Medicine / Pediatrics; Pediatrics / Emergency Medicine; Pediatrics Emergency Medicine (Pediatrics); Critical Care Medicine (Anesthesiology, Critical Care Medicine (Internal Medicine); Surgical Critical Care; Critical Care Medicine (Obstetrics and Gynecology)
Obstetrics and Gynecology	Obstetrics, Gynecological Oncology; Reproductive Endocrinology; Obstetrics and Gynecology; Maternal and Fetal Medicine; Gynecology
Pathology	Anatomic / Clinical Pathology; Neuropathology; Dermatopathology; Forensic Pathology; Hematology (Pathology); Clinical Pathology; Anatomic Pathology, Blood Banking / Transfusion Medicine; Medical Microbiology; Selective Pathology; Pediatric Pathology; Immunopathology; Cytopathology; Chemical Pathology
Psychiatry	Psychiatry / Neurology; Addiction Psychiatry; Psychiatry; Forensic Psychiatry; Geriatric Psychiatry; Psychoanalysis
Anesthesiology	Pain Management (Physical Medicine and Rehabilitation; Anesthesiology; Pain Management
Radiology	Pediatric Radiology; Abdominal Radiology; Musculoskeletal Radiology; Nuclear Radiology; Neurology / Diagnostic Radiology / Neuroradiology; Radiology; Neuroradiology, Radiological Physics; Vascular and Interventional Radiology; Diagnostic Radiology
Emergency Medicine	Sports Medicine (Emergency Medicine); Internal Medicine / Emergency Medicine; Medical Toxicology (Emergency Medicine); Emergency Medicine; Pediatric Emergency Medicine (Emergency Medicine)

Forecasting Specialty Grouping	*American Medical Association Specialty*
General Surgery	General Surgery; Transplant Surgery; Head and Neck Surgery; Surgical Oncology; Pediatric Surgery (Surgery); Pediatric Cardiothoracic Surgery; Dermatologic Surgery; Craniofacial Surgery; Hand Surgery (Surgery); Colon and Rectal Surgery; Hand Surgery; Abdominal Surgery; Trauma Surgery; Vascular Surgery
Ophthalmology	Ophthalmology; Pediatric Ophthalmology
Otolaryngology	Otolaryngology; Pediatric Otolaryngology; Otology / Neurotology
Orthopedic Surgery	Pediatric Orthopedics; Adult Reconstructive Orthopedics; Sports Medicine (Orthopedic Surgery); Orthopedic Surgery of the Spine; Orthopedic Trauma; Hand Surgery (Orthopedics); Orthopedic Surgery; Foot and Ankle, Orthopedics
Urology	Urology; Pediatric Urology
Other Surgical Specialties	Thoracic Surgery; Hand Surgery (Plastic Surgery); Plastic Surgery; Facial Plastic Surgery; Pediatric Surgery (Neurology); Neurological Surgery
Other Specialties	Radiation Oncology; Physical Medicine and Rehabilitation; Sports Medicine (Physical Medicine and Rehabilitation; Spinal Cord Injury Medicine; Pediatric Cardiology; Occupational Medicine; Medical Genetics; Addiction Medicine; Clinical Biochemical Genetics; Clinical Cytogenetics; Clinical Genetics; Legal Medicine; Sleep Medicine; Palliative Medicine; Osteopathic Manipulative Medicine; Clinical Pharmacology; Epidemiology; Pharmaceutical Medicine; Medical Management; Clinical Molecular Genetics; Aerospace Medicine; Vascular Medicine; Occupational Medicine; Nuclear Medicine; Neurology; Child Neurology; Clinical Neurophysiology; Neurodevelopmental Disabilities (Psychiatry and Neurology); Dermatology; Clinical and Laboratory Dermatological Immunology; Child and Adolescent Psychiatry; Other