

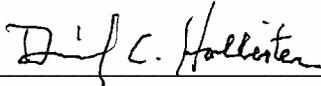
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Acknowledgements

October 2004

We would like to thank the members of the Health Care Workforce Development in Michigan Advisory Roundtable for their willingness to meet frequently during the summer of 2004 and to provide us with insights and information that were invaluable in the success of this project. We would also like to thank the staff at Public Policy Associates, Incorporated, for managing this project effectively from start to finish and for compiling the key information resources—occupational forecasts, occupation profiles, and model employment practices—needed to understand the growing demand for and importance of health care careers in Michigan. Finally, we would like to thank our own staffs for their assistance throughout this project.



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Executive Summary

The Importance of Health Care to Michigan's Economy

- Health care is Michigan's largest industry in terms of employment
- There are 445,000 jobs directly related to health care and 233,000 jobs indirectly related to health care
- Health care employment provides \$17.7 billion per year in wages and benefits in Michigan
- Health care employees earn an average of \$34,300 per year (2001) and contribute \$55,000 annually to the local economy

Health Care Provides Opportunities to Grow and Upgrade Michigan's Workforce

- Michigan workforce shortages currently exist for well-paid occupations such as nurses, pharmacists, therapists, lab technologists, imaging technicians, and others
- Demand for health care workers will grow as Michigan's baby boomers get older, as the total population grows, and as new entrants to the labor force decline

Health Care Workforce Development in Michigan Project (June – September 2004)

- Products developed through this project
 - Supply and demand forecasts for 30 professional and technical health care occupations
 - Profiles of each occupation, including education, certification, wages, and other data
 - Database of model practices for expanding the health care workforce
- Findings
 - There are current and anticipated employment opportunities for all health care professional and technical occupations in Michigan, **not just nurses**
 - Health care workforce shortages are evident across the state, especially in rural areas
 - Shortages of some health care occupations—such as nursing, pharmacy, and EMTs and paramedics—pose serious threats to the future health and safety of Michigan residents.

- There are no quick fixes—health care workforce development will be a **long-term effort**
- Opportunities for growing the workforce in this industry are likely for the next 20 years
- Opportunities exist for workers at all ages and at all stages of their careers
- A variety of model practices for growing the health care workforce have been identified:
 - ◆ Models for recruiting new workers into the pipeline
 - ◆ Models for upgrading the skills and knowledge of incumbent workers
 - ◆ Some information on transitioning displaced workers from manufacturing or other industries to new careers in health care has been identified; more is needed

Lessons Learned and Recommendations

■ Lesson learned

- Successful models exhibit high levels of collaboration among employers, educators, professionals, and government
- Successful education programs exhibit high levels of flexibility as to where career education is provided, when it is provided, and how it is administered
- A shortage of qualified health care career faculty is an impediment to expanding the health care workforce
- Health care career faculty are needed for both classroom and clinical education
- Expanding the health care workforce is costly
 - ◆ Health care career education requires expensive equipment and facilities
 - ◆ Health care career education is usually conducted in small classes

■ Recommendations

- Use the products from this project (supply and demand forecasts, occupational profiles, and model practices database) to assist Regional Skills Alliances, workforce investment boards, and Michigan Works! agencies
- Maintain and update the information resources developed through this project
 - ◆ Regularly update the occupational profiles, model practices database, and health care occupations forecasts
 - ◆ Make these materials available online as part of MDLEG's Career Portal Web site

- Maintain the Health Care Workforce Development in Michigan Advisory Roundtable temporarily to review recommendations and advise on program implementation
 - ◆ Establish Advisory Roundtable subcommittees to address the unique issues posed by
 - Licensed professionals
 - Unlicensed professionals, technicians, and direct care workers
 - Labor unions and employers
- Use these resources to apply for USDOL-ETA health care workforce demonstration grants and other public and private workforce development funding
- Promote Michigan's participation in the Census Bureau's Local Employment Dynamics (LED) system to provide Michigan with more detailed local workforce data
- Conduct a statewide survey of employment vacancies, turnover, and anticipated needs among Michigan health care employers, including clinics, physician offices, hospitals, and others
- Evaluate the capacity of health care career education programs in Michigan to meet anticipated needs; identify faculty, facility, and resource shortages in health care career education
- Coordinate health care workforce development efforts with the Lieutenant Governor's Commission on Higher Education

Introduction: The Importance of Health Care to Michigan's Economy

For the past 100 years Michigan's economy has been associated with durable goods manufacturing and, in particular, with the manufacture and assembly of automobiles. In recent years, however, it has become increasingly evident that Michigan also has a very strong presence in the provision of health care services to the residents of Michigan, medical education, pharmaceutical research and manufacturing, and other health care-related activities. This is undoubtedly due to the presence of four medical schools, extensive graduate medical education, and a number of world-class medical centers and community hospitals throughout Michigan. As a result, recent analysis indicates that health care has become Michigan's largest industry, with more residents employed in health care-related activities than any other. Moreover, unlike the cyclical nature of manufacturing, health care is one of the most stable sectors in Michigan's economy. A study conducted by the Minnesota IMPLAN[®] Group, Inc. (MIG, Inc.) for the Michigan Health & Hospital Association (MHA), the Michigan State Medical Society, and the Michigan Osteopathic Association earlier this year reported that more than 658,000 jobs and \$25 billion in wages and salaries are generated annually in Michigan either directly or indirectly by the state's health care industry (MHA, 2004).

Health care in Michigan is not only an important industry from a statewide perspective, but it is also a very important industry for the economic stability and well being of numerous individual Michigan communities. In fact, health care employment is the single largest employment category in numerous Michigan communities, especially those in which a community hospital is located. Figures from the MIG, Inc. study, below, illustrate the importance of health care employment in Michigan's ten largest counties.

Table 1: Health Care Employment in Michigan's Ten Largest Counties

County	Direct Health Care Jobs	Wages, Salaries, and Benefits (\$Billions)
Wayne County	80,723	\$3.500
Oakland County	64,217	\$2.800
Kent County	31,701	\$1.300
Macomb County	25,608	\$1.100
Washtenaw County	23,777	\$1.100
Genesee County	20,997	\$0.982
Ingham County	15,819	\$0.689
Kalamazoo County	13,264	\$0.629
Saginaw County	13,229	\$0.558
Ottawa County	7,883	\$0.263

Source: Minnesota IMPLAN Group, Inc., 2004.

Other sources of data verify the size of Michigan's health care workforce and the importance of health care services to Michigan's economy. The Census Bureau's *County Business Patterns* report indicated that direct health care employment in Michigan in 2001 provided 445,000 people with jobs earning an average annual income of \$34,000 (excluding physicians). Between 1988 and 1998, Michigan health care employment grew four times the rate of statewide population growth (28% versus 7%).

The health care industry also holds great promise for the future, both in Michigan and elsewhere throughout the nation, as the nation's population ages and the demand for health care services and the individuals to provide those services continue to grow. In 2000, Michigan's older population (those aged 65 and older) numbered approximately 1.2 million. This number will grow to 1.5 million by the year 2015 when the first wave of the baby-boom generation reaches retirement age. In addition, the oldest members of our population (those aged 85 and older) are growing at an even faster pace as medical science and overall quality of life allows Americans to live longer than ever before. The need for health care services will increase dramatically as the population lives longer and grows older.

From a somewhat different perspective, as a relatively large proportion of health care occupations require high levels of education and/or highly specialized skills, the average salaries

of those employed in the health care sector tend to be higher than the statewide average,¹ and these occupations typically are not subject to layoff or downsizing. Also, few of these jobs are likely to be moved off shore. In addition, due to the direct interaction between patient and caregiver that characterizes most health care activities, most outsourcing of ancillary or support activities (such as laundry or physical therapy) is done locally.

There are, however, chronic and significant shortages in a number of health care professions—both in Michigan and across the nation. Among the most significant shortages are professional nurses, rehabilitation therapists, and laboratory technicians. In February 2004, RNs became the U.S. Department of Labor’s most in-demand occupation with the largest ten-year job growth among all occupations.

In 2001, First Consulting Group of San Diego, California, conducted a nationwide study of health care workforce shortages at American hospitals on behalf of the American Hospital Association and others. As illustrated in Figure 1, hospitals across the nation at that time reported vacancies in excess of 10% for RNs, imaging technicians (e.g., radiographers, mammographers, etc.), pharmacists, licensed practical nurses, and laboratory technicians.

¹ Physicians are not included in this study.

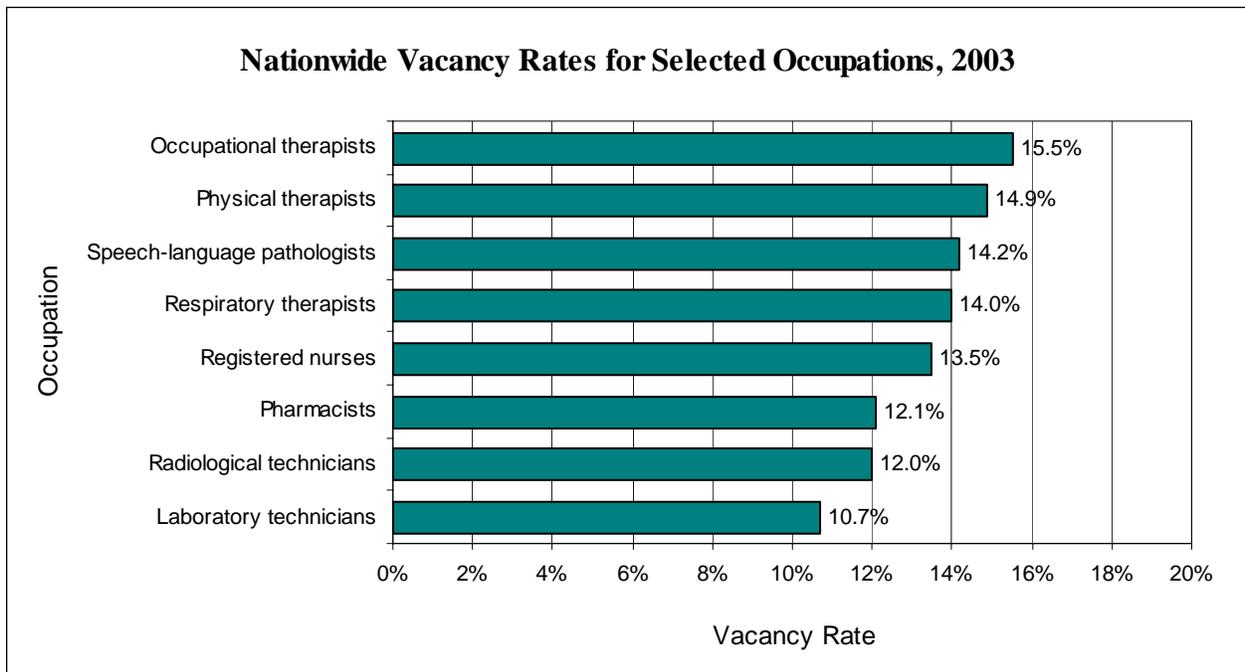


Figure 1

Source: American Hospital Association; First Consulting Group, Inc., 2001.

In a more recent study by the Bernard Hodes Group (2003) of vacancy rates and occupational turnover among health care organizations across the nation, vacancy rates in excess of 10% were reported for a wide variety of highly skilled technical occupations in hospitals and other health care facilities, including occupational and physical therapists, RNs, pharmacists, radiological technicians, and laboratory technicians.

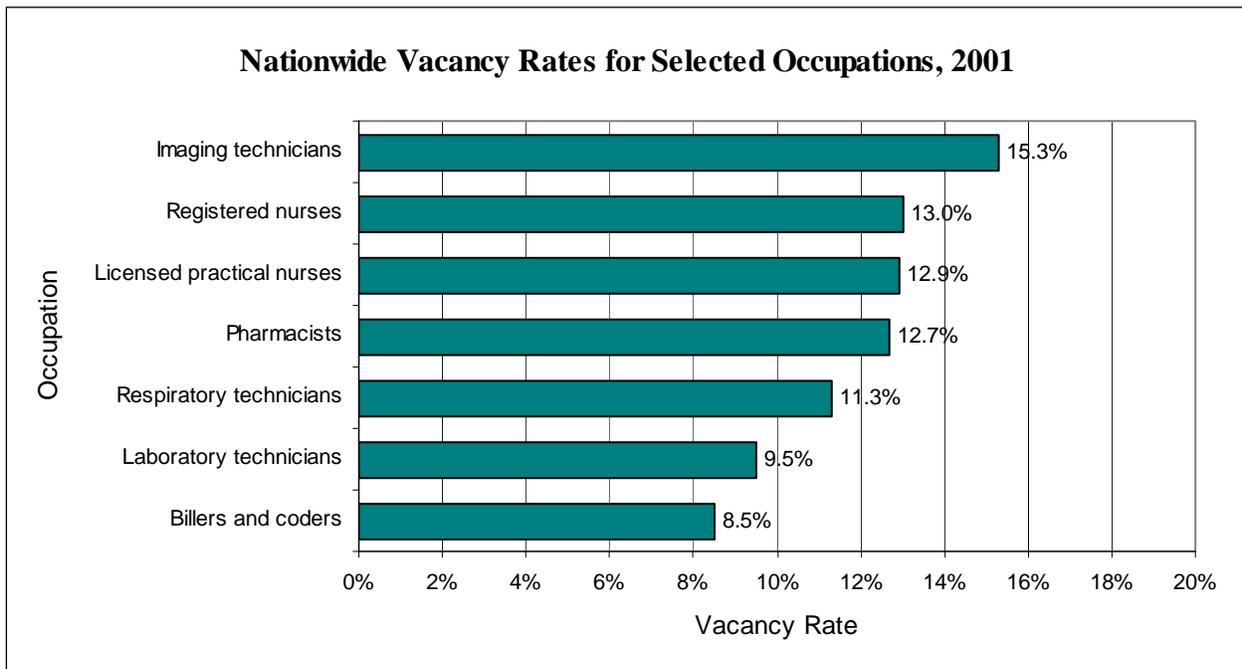


Figure 2
 Source: Bernard Hodes Group, Health Care Metrics Survey, 2003.

Turnover rates for these occupations at hospitals and other health care service providers (physician offices, medical laboratories, and long-term care facilities, for example) are also quite high as a result of these shortages. Among the 151 respondents to the Bernard Hodes Group survey, RNs had the highest turnover rate (15.5%) followed by therapists—e.g., occupational, respiratory, physical, and speech/language therapists (13.5% to 14.9%)—radiological technicians (12.1%) and pharmacists (12.0%).

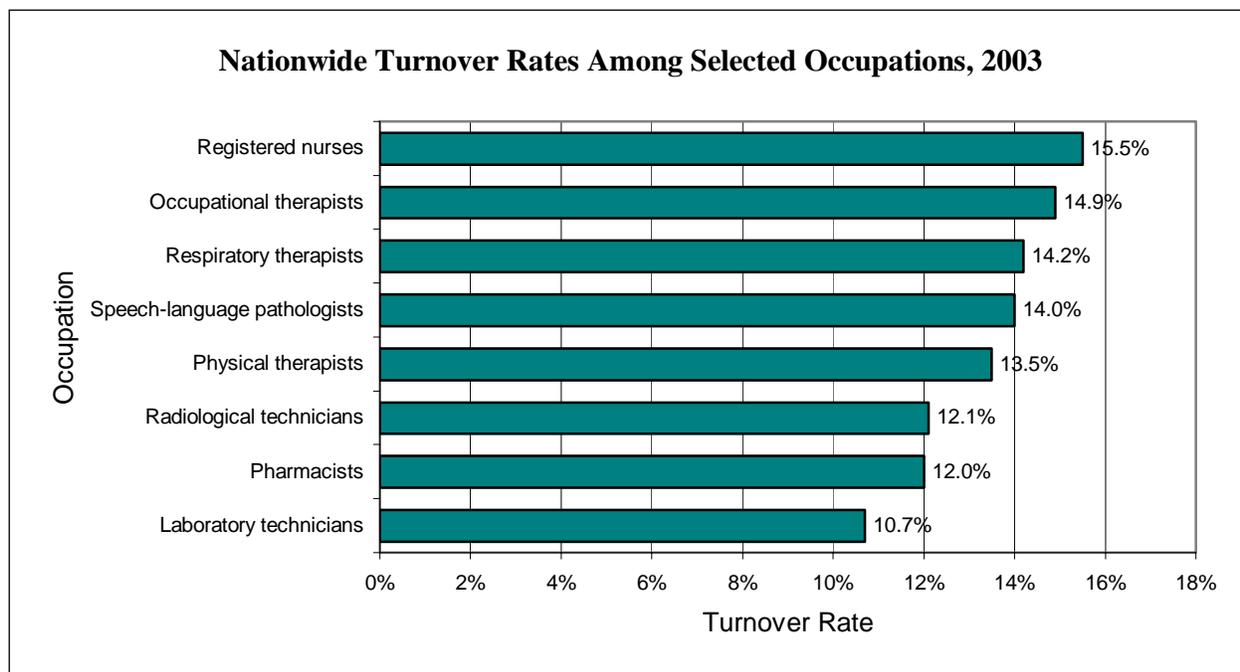


Figure 3

Source: Bernard Hodes Group, Health Care Metrics Survey, 2003.

Some of these shortages have resulted in greater competition to fill these positions, increases in the financial incentives to attract new hires, and greater efforts to retain and upgrade the skills of current health care team members. A recent study by the staff of Voluntary Hospitals of America (VHA) has shown that the costs associated with staff turnover comprise a major expense to health care employers that could be avoided if more adequate supplies of well-educated and certified health care workers were available. VHA estimates that the overall cost of recruiting and orienting a staff nurse, for example, is roughly equal to that nurse's entire annual salary (Keith and Olivio, 2002).

Based on the size and importance of health care services and organizations within Michigan's economy and the critically important workforce training and development component that is required to maintain and grow a qualified and available workforce, the Michigan Department of Labor & Economic Growth (MDLEG) and the Michigan Department of Community Health (MDCH) have joined together to target this industry's potential for strengthening Michigan's current economy and for aligning Michigan's economy with the workforce trends of the future. Moreover, this effort is designed to provide Michigan residents the opportunity to acquire the

education and technical skills to fill a growing number of stable, well-paying, and desirable jobs that are available close to home. Public Policy Associates, Incorporated (PPA), a Lansing-based public policy research, evaluation, and development firm, was hired to analyze Michigan's health care workforce. Among PPA's main responsibilities were estimating future supply and demand for 30 health care occupations, compiling profiles for each of these occupations, and identifying innovative ideas for expanding and upgrading Michigan's health care workforce.

Description of the Project

As a key part of Michigan's ongoing effort to align workforce development with economic development, the purpose of this project is to establish clear and measurable benchmarks and to facilitate coordination among the various stakeholders to assure that Michigan has an adequate supply of skilled professional health care workers to fill both current and anticipated positions within Michigan's health care sector.

Operationally, the goals of this project are to provide a detailed understanding of the health care workforce in Michigan to MDLEG and MDCH so that they can identify appropriate occupational targets in their efforts to grow Michigan's economy, recruit and train Michigan residents to fill important and well-paying health care occupations, and help employers meet their need to provide fully staffed health care facilities and well-trained health care providers within the communities they serve. Several specific tasks were identified to meet these needs:

- *Identify a core set of health care occupations upon which to focus.* Based on discussions among MDLEG, MDCH, and PPA staff during the early stages of this project, it was decided that the most appropriate targets of this project would be several of the most in-demand professional and technical health care occupations within the following four groups:

- Licensed health care practitioners (excluding physicians)²
- Therapists
- Other health care technical occupations
- Health care support occupations

Direct care workers, including certified nursing assistants (CNAs), nursing aides, psychiatric aides, orderlies, and others who provide similar services, are not included in this study.

- *Identify current and future occupational patterns for each target occupation.* Using available labor market statistical information and standard forecasting techniques, current numbers and projected demand and supply of health care professionals were calculated for the entire state and for each of Michigan's 18 labor market areas. This information was used to determine which professions were likely to be in greatest demand in the future.
- *Compile a comprehensive profile of each targeted occupation.* Although the research team recognizes that extensive information about each health care occupation and profession is available from a number of sources—including the U.S. Department of Labor, the Michigan Occupational Information System (MOIS), the Michigan Health Council, and others—each of these sources is incomplete in terms of providing comprehensive and up-to-date information targeted towards adults regarding health care occupations and careers. For this reason, each occupation targeted within this project was profiled using data resources compiled from each of the preceding sources and others in order to provide MDLEG and MDCH a single background document for use in developing specific programs and/or directing individuals towards learning about specific health care occupations.

Each profile brings together a number of vital pieces of information concerning the specific occupation, including the following:

² Physicians were excluded because the recruitment, training, and licensure of both allopathic and osteopathic physicians is highly regulated and is largely outside of the direct influence of the economic development or workforce development efforts of MDLEG. It was also discovered shortly after this project began that efforts to study Michigan's physician workforce issues were already under discussion by Michigan's four medical schools, the Michigan State Medical Society, the Michigan Osteopathic Association, and other organizations, and any analysis by MDLEG would be redundant.

- Occupational title and brief description
- Current salary levels
- Occupational prospects
- Educational requirements
- Testing and licensure requirements, if any
- Sources of additional information

■ *Identify model practices for attracting, recruiting, training, and retaining health care professionals and technicians.* The most critical task of this project has been to identify model practices that might be proposed and successfully used by statewide and local agencies, employers, consortia, and others to address many of the key health care workforce shortages in Michigan. This project identified three target populations to which these practices might successfully be employed.

- New entrants into the labor force (“pipeline issues”): Identify practices that inform decision making, stimulate interest, and recruit high school and postsecondary students to pursue education regarding health care occupations, as well as provide them with effective educational and training programs.
- Current employees (career ladders and lateral career paths): Identify practices to enhance employee retention and to upgrade current health care workers through additional education, cross training, expanded responsibilities, work place and occupational redesign, etc.
- Displaced workers: Identify practices to transition displaced workers from manufacturing or service occupations to health care occupations by capitalizing on skills they already have and providing them with the additional education and training they need to adopt new careers.

- *Professional oversight and advice.* In addition to each of the specific tasks identified above, a critical facet of this project was the recognition that support and acceptance of this project among health care professionals and organizations that are involved in recruiting, educating, and employing health care professionals was absolutely necessary for this project's ultimate success. In addition, it was reasoned that individuals representing these key constituents would provide an invaluable source of information and advice about professional issues, training programs, educational trends, and other nuances that could help to direct this project away from pitfalls and towards success. Based on this recognition, the Health Care Workforce Development in Michigan Advisory Roundtable was established in order to provide MDLEG, MDCH, and PPA staff with ongoing advice and to review the results of work in progress.

Once this project got under way, the Advisory Roundtable was convened three times at the Michigan Public Health Institute in Okemos. Each meeting of the Advisory Roundtable was chaired by a member of the executive staff of MDLEG. The first meeting provided the advisory group with an overview of the project and its goals; this meeting also helped to identify the occupations that were targeted in this project. The second meeting provided the group with an opportunity to review preliminary products including preliminary occupational forecasts, preliminary occupational profiles, and a preliminary database of "model" practices. Significant changes in the format and content of each of these products resulted from discussions at the second meeting. The third meeting provided the group with revised versions of each product as well as the opportunity to discuss future efforts that might follow completion of this project.

The Advisory Roundtable was designed to include representatives of all relevant stakeholders involved in health care workforce issues in Michigan. Among others, these included:

- Health care practitioners
- Four-year colleges and universities
- Community colleges

- Intermediate school districts
- MDLEG and MDCH staff
- Governor's office
- Professional associations
- Hospitals
- Michigan Works!

A complete list of the members of the Health Care Workforce Development in Michigan Advisory Roundtable can be found in Appendix A.

In addition to the external review and advice provided by the Advisory Roundtable, internal meetings were conducted every two to three weeks with the executive staff of MDLEG, MDCH staff, and PPA staff involved with this project.

Occupational Profiles

As the discourse on health care careers and workforce development continues, MDLEG saw a need for a repository of data on health care occupations specifically created for stakeholders in Michigan. The Department recognized the need for a central, integrated resource that could be used by many stakeholders, including career counselors, students, and dislocated workers, to name a few. This need was made clear as the research team began to pull together data from hundreds of disparate sources to describe the landscape of health care careers and how these occupations could offer some answers for the workforce development system, educators, and current health care workers in Michigan. Each of these compartmentalized sources crystallized the reality that the health care system is fragmented, with little sector-wide information, planning, and coordination among:

- Individual professions and networks.
- Health care profession educational organizations.

- Licensing and certification standards and processes.
- The broader workforce system.

One strategy to manage this fragmentation is to create an intersystem repository of health care occupation information. This intersystem repository addresses the compartmentalization of resources, knowledge, and information for many potential users. Having access to information across a broad spectrum of health care careers can address fragmentation in a variety of ways.

- Individual professions and networks can communicate with a common language and with an equal opportunity to access resources. Individual professions can have access to one comprehensive resource that provides information about licensing requirements for their profession, educational opportunities within their field, and transferable skills.
- Health care professional organizations can benefit from this repository as well. For example, professional associations would have a comprehensive resource to which they can refer others that could potentially help strengthen the quality of practitioners in their profession.
- The occupational profile system offers a comprehensive overview so that students and new professionals can learn about the licensing and certification requirements for their profession and begin to operationalize their training as they gain experience in their field.
- MichiganWorks! counselors and other workforce and career development professionals have one source to which they can refer their clients. Within this resource, users can discover a general description of the health care career, the median annual income, and other resources that may be useful when providing counsel on career goals and career planning.

Data-Collection Strategy

The Advisory Roundtable was used extensively to develop the data-collection strategy for the health care occupation profiles. The Advisory Roundtable was established to provide a context of expertise from which to draw insights relating to the various aspects of this project. Using this context of expertise, the following data-collection strategies were developed:

- Collect data from reliable federal government sources of data:
 - Data was collected from the Bureau of Labor Statistics (BLS) Web site (www.bls.gov/oco/home.htm) to inform the career outlook section of the profile.
 - Data was also collected from two Web sites in order to reference funding sources available to individuals seeking training.
 - ◆ www.studentaid.ed.gov
 - ◆ www.michiganworks.gov

- Collect data from reliable state government sources including:
 - Michigan Labor Market Information (LMI).
 - ◆ LMI data (www.michlmi.org) was used to report the wage information included in the profiles.
 - ◆ The LMI occupational descriptions were used to describe each occupation included in the profiles.

 - The Michigan Career Portal was used to provide links to other resources useful to individuals seeking additional information.

 - The Michigan workforce development system through MichiganWorks! is listed as a resource for career counseling and funding opportunities.

 - Michigan Department of Community Health, Bureau of Health Professions was used extensively to help the research team understand the context of licensing and credentialing for each health care occupation. The licensing information, Public Health Code, and Administrative Rules included in the profiles were captured from the Bureau of Health Professions Web site: http://www.michigan.gov/mdch/0,1607,7-132-27417_27529---,00.html.

- Collect data from state and national occupation-specific organizations.
 - Each state and national association, society, or council Web site was reviewed for useful information for the profiles.
 - ◆ These organizations were also called to determine what sources of information might be useful.
 - The Web sites of accrediting bodies were reviewed to discover information pertaining to educational requirements and opportunities for each occupation included in the profiles.

- Collect data from other miscellaneous sources recommended by the Advisory Roundtable. The Advisory Roundtable also suggested other Web sites and reports that included valuable information. These include:
 - Michigan Health Opportunities for Today and Tomorrow (www.mihott.com). The Michigan Health Council in partnership with the Michigan Pharmacy Association created this Web site.
 - *Scope of Practice of Health Professionals in the State of Michigan* prepared by Public Sector Consultants with sponsorship from the Michigan State Medical Society and the Michigan Osteopathic Association (2001). This is a manual that describes the landscape of health care professions broken down by profession.
 - American Medical Association's 2004-2005 edition of the *Health Professions Career and Education Directory*. This includes information on 6,500 educational programs in 64 different professions and is referenced in the education section of our profiles.

Structure of Profiles

The profiles are structured into eight major sections with additional subsections:

- *Wages*. This section reports wage information for each occupation as an hourly rate and an annual rate as reported by the following sources:

- Labor Market Information (2002)
 - U.S. Department of Labor, Bureau of Labor Statistics (2003)
- *Outlook.* Employment levels for each profiled occupation are provided, where available, for metropolitan areas in Michigan. The overall outlook for that occupation, as determined by the U.S. Department of Labor's online *Occupational Outlook Handbook, 2004-2005 Edition* (<http://bls.gov/oco/>).
 - *Credentialing.* If the profession is a licensed profession in the state of Michigan, the licensing requirements are noted in this section. The Public Health Code and the Administrative Rules are summarized as well to provide the user with an in-depth look into the occupation.
 - *Education.* The purpose of this section is to provide users with information on preparation for this occupation. The educational requirements for each occupation are included as well as links to finding educational programs in the state of Michigan.
 - *Transferable Skills.* A link to a skill identifier tool is provided [http://www.acinet.org/acinet/skills_home.asp]. The purpose of this section is to provide tools to help workers interested in health care understand how their skills can be used in a variety of health professions.
 - *Funding.* These sources provide users with a first glance at the funding opportunities available for training.
 - National resources
 - State resources
 - *Resources.* This section provides additional resources so that users can dig deeper into the various professions to get the information they need to meet their needs.
 - State association
 - National association

- Accrediting organization
- Other occupation-specific organizations

List of Occupations Included

Licensed Health Care Practitioners

Chiropractors*

Dentists*

Optometrists*

Pharmacists*

Physician assistants*

Podiatrists*

Registered nurses (RNs)*

Therapists

Occupational therapists*

Physical therapists*

Radiation therapists

Respiratory therapists*

Allied Health—Technicians and Technologists

Cardiovascular technologists and
technicians

Dental hygienists*

Diagnostic medical sonographers

EMTs and paramedics*

Laboratory technicians

Laboratory technologists

Licensed practical nurses (LPNs)*

Medical records/health info technicians

Nuclear medicine technologists

Pharmacy technicians

Radiological technologists and technicians

Respiratory therapy technicians

Surgical technologists

Health Care Support Occupations

Dental assistants*

Medical assistants

Occupational therapist aides

Occupational therapist assistants*

Physical therapist aides

Physical therapist assistants

* Occupations licensed in the state of Michigan.

Occupational Forecasts

Changes in both the supply and demand for health care workers vary over time and vary from place to place depending on the availability of educational resources, the level of education and skill that is required for each occupational category, and the demographic and economic characteristics of individual communities or regions. Changes in any of these factors, as well as changes over time, may lead to temporal variations in the supply of and demand for services provided by health care professionals and other health care workers. Within the broad category that incorporates all health care workers, changes in the supply of specific occupational categories may vary considerably. Changes in the supply of physicians may take up to 12 years to affect (e.g., four years of college, four years of medical school, and several years of postgraduate medical education and advanced training). In contrast, the supply of qualified individuals in a number of health technology and allied health professions (e.g., diagnostic medical sonographers, dental assistants, and cardiovascular technologists) may require as little as one or two years of formal, postsecondary education. These observations concerning the ability to change the supply of health care professionals are only valid, however, if appropriate education or training is available, if individuals are willing to be trained, and if regulatory barriers to new recruits or retraining of other health care professionals do not impede this process.

For the purpose of this project, “midterm” forecasts of both the demand and supply of 30 health care occupations in Michigan have been compiled. “Midterm” forecast refers to future estimates that fall between relatively short-term forecasts of up to 5 years—forecasts that are often employed to chart short-term trends in the economy—and long-term forecasts of between 20 and 50 years into the future. The latter are often employed by economists and demographers to chart the broad sweeps of economic and demographic change that provide the context within which more specific trends may be anticipated. Recognizing that the goal of this project is to provide information that will inform and help to align workforce and economic development policies that may be implemented immediately and that will have significant impact on Michigan’s economy in only a few years, “midterm” forecasts of Michigan’s health care workforce in the years 2010

and 2015 will indicate where the state is likely to be and what may need to be changed as it moves toward the future in this large and important sector of Michigan's economy. Also, the supply forecasts presented below have been calculated specifically with regard to Michigan's existing capacity to train the health care professionals and technicians that our growing and aging population will demand. While there is always some migration among health care professionals and technicians into and out of Michigan in response to educational and career opportunities elsewhere, family life cycle changes, or personal preferences, the principal focus of this report is to examine the demand for qualified health care workers in Michigan and to determine if Michigan's capacity to meet this demand through existing policies, programs, and resources is adequate.

Forecasts

Demand Forecasts

The basis for the forecasts to 2015 that are included in this report are occupational data produced by MDLEG. MDLEG's Labor Market Information Division, in cooperation with the U.S. Department of Labor, produces forecasts of Michigan's labor force with details about a large number of specific occupations and details about 18 labor market areas within Michigan. These forecasts are tied to national economic forecasts, specific industry forecasts (i.e., the automobile industry in Michigan), and population trends. They are currently available on the MDLEG/LMI Web site (www.michlmi.org/forecast/) to the year 2010.

Using MDLEG data as the starting point, PPA has developed a set of forecasts that identify the demand for specific health care occupations for Michigan and for each of its labor market areas for the years 2005, 2010, and 2015. PPA's forecasts for this report are ratio-based calculations that adjust census-year population data, demographic projections, and employment forecasts to the age distribution of Michigan's census count and to projected changes in the population age distribution over time. Specifically, PPA's occupational forecasts are weighted to reflect the potential demand of the population aged 65 and older. It has been well documented that the greatest demand for most health care services (with some notable exceptions such as obstetrical and pediatric services) are generated by those aged 65 and older, and usage tends to increase as the population lives longer and ages. Using the most recent census data (year 2000) and the most

recent MDLEG/LMI data for the number of working practitioners, annual estimates of the number of practitioners per 100,000 older Michigan residents are calculated for the intervening years and extrapolated to the years 2010 and 2015.³ The key variable in these calculations is change in the projected numbers of Michigan's 65-and-older population.

Supply Forecasts

The likely supply of health care professionals in any individual occupational category is more difficult to predict as it may be the product of such factors as the overall economic climate, the availability of access to career-appropriate education and training, work effort by those employed in the profession or occupation, changing health care delivery models, public perceptions of the desirability of specific occupations, the availability of competing or alternative occupations, working conditions, and the adequate numbers of individuals in the population to draw from.

It was originally intended that a cohort-component or a "trends" model would be employed to forecast the anticipated supply of health care workers in each of the 30 occupational categories chosen for analysis. This model assumes that underlying all such forecasts is the well-documented relationship between gross domestic product and health care spending in the United States: as gross domestic product is expected to continue growing in the future, health care spending will continue to increase and will stimulate the growing employment of health care workers in various occupations and professions. In addition, this approach views physicians, nurses, and other health care professionals as cohorts that ebb and flow over time. These cohorts grow through new graduates into the occupation or profession and decline through retirement and other periodic exits from the profession, changes in the composition of the profession (e.g., gender) that may be related to work effort (e.g., full-time versus part-time work), and

³ Casual observation of occupational forecasts prepared by MDLEG/LMI and professional licensure files maintained by the MDCH typically reveal wide variation between these two sources. This may be attributed to the inclusion of all current licensees in the licensure file, including retirees who maintain their professional licenses, those who have temporarily withdrawn from the labor force, those who reside and work outside Michigan but retain a Michigan license, those who are licensed but who do not provide professional services (such as RNs who serve as health care executives), and those who are unemployed or who are between jobs. The only source of these data is the licensure renewal forms. In contrast, MDLEG/LMI occupational data are based on annual employer surveys and wage-record data that identify individuals who are actually working and the occupations in which they are working, regardless of their professional license.

opportunities and trends in the substitution of one health care professional (e.g., physician assistants or advanced-practice nurses) for another (e.g., physicians in primary care practice).

With the exception of data regarding physicians and the changes that are affecting the practice of medicine in the United States, there is relatively little data available regarding the characteristics of incumbents in most of the health care occupations that are examined in this project. For purposes of this project, therefore, forecasts of the supply of technicians, technologists, health care professionals and health care support workers will be in the form of “best case” scenarios that examine current availability of training opportunities in Michigan for each profession or occupation and assume that each of these programs will operate at full capacity through 2015 and that all program graduates will find work in Michigan after graduation and stay here. For example, if Michigan colleges and universities have indicated that they currently have the capacity to enroll a maximum of 180 students in a two-year occupational therapist assistant program, these “best case” supply forecasts assume that 90 new occupational therapist assistants will graduate and enter Michigan’s health care labor force each year through 2015 and remain in Michigan indefinitely. While we recognize that health care workers can and do move from state to state to practice their professions, these forecasts are designed to help us understand the opportunities for recruiting and educating Michigan residents to qualify for these positions, many of which are presently, and will continue to be, in short supply in the future.

These forecasts also take into account MDLEG/LMI estimates of the anticipated need for new and replacement workers in each of these occupations. These occupational forecasts are somewhat tempered by also accounting for the proportion of the replacement workers that represent routine employment turnover rather than new entrants to the workforce that are replacing retirees or others who are permanently or temporarily exiting the workforce.

Educational capacity data were derived from the American Medical Association (AMA) 2004-2005 edition of the *Health Professions: Career and Education Directory* and other sources. Turnover rates among specific occupations and professions were derived from national surveys of allied health occupations conducted by First Consulting Group (2001) and the Bernard Hodes

Group (2003). Known turnover rates were applied to similar occupational groups when specific data were not available for those occupations.

Caveats

The occupational demand and supply forecasts provided in this report are intended to be indicative of broadly anticipated trends within each of the specified occupations and professions. They are intended to indicate the general direction of change in demand for these occupations over the next ten years, the change in the supply of professionals in each category assuming full enrollment and completion in all educational programs that currently exist (assuming no growth or decline in the number or capacity of these programs), and the overall magnitude of the gap between demand and supply that may be anticipated as these trends progress over time.

These figures are not intended to be definitive forecasts of the precise demand or supply of future health care professionals in Michigan. Future advancements in medical technology, pharmaceuticals, or health care delivery systems may affect demand for services and professionals in ways that cannot be anticipated at this time. Similarly, increasing the actual supply of health care professional and technical workers—which is the ultimate goal of this project—may be affected by policy initiatives and economic decisions. For example, increases or decreases in educational capacity, alteration of pay scales, migration of health care workers from other states or nations, and implementation of practices that promote health care employment among populations that were previously ignored will all affect the supply of health care professionals and technical workers. If this project is successful, the supply of health care professionals and technical workers will increase, and the supply forecasts presented here will be proven wrong.

It is also likely that the capacity of Michigan educational institutions to provide training for each of these occupations and professions may be understated in a few cases. While the AMA's *Health Professions: Career and Education Directory* is the most comprehensive source of information on 40 occupational categories (and almost twice that many specific occupations), these data do not cover all of the occupations specified in this report, and some of the data reported are not entirely up to date. For example, five programs are identified as providing

training for diagnostic medical sonographers in Michigan, but local health care employment experts indicate that at least one and possibly three or four other educational institutions currently provide that training in Michigan as well. Therefore, the capacity for professional sonography training in Michigan is likely to be understated for this profession. This may also be the case for some of the other occupations targeted in this report.

In addition, the use of educational capacity as a driver of occupational supply is intended to serve as a benchmark against which progress may be measured. Capacity may grow or decline over time in reaction to the demand for health care professionals, enrollment by students, and the financial ability to support what, in many instances, are relatively expensive educational services. It is also recognized that even with capacity enrollments, all students will not necessarily complete their course of study, and not all of those that do will necessarily enter into the occupation or profession for which they have trained.

Statewide Occupational Forecasts

Licensed Health Care Practitioners

- Registered nurses. Although interest in nursing and enrollments in registered nursing programs have reversed the declines of the 1990s, even full enrollment in nursing programs in Michigan will lead to significant shortages by 2010 and 2015. Barring any increase in capacity and without the addition of foreign-trained nurses or the use of nurse-extenders, the shortage of RNs in Michigan will be almost 7,000 by 2010 and almost 18,000 by 2015. Interviews with nurse executives and nursing educators have verified that one of the most significant barriers to expanding the cadre of qualified and available RNs in Michigan (and elsewhere) is the very limited supply of qualified nursing faculty. Please note that there are no breakouts for advanced-practice nurses elsewhere in this report. According to the Health Resources and Services Administration (HRSA, 2004), there are currently 2,895 advanced-practice nurses in Michigan with active licenses. These include 1,190 nurse practitioners, 258 certified nurse-midwives, and 1,447 certified registered nurse anesthetists.

- Chiropractors. There were almost 3,500 chiropractors in practice in Michigan in 2000. If there are no changes in current utilization patterns, the demand for practitioners of

chiropractic in Michigan will grow to approximately 4,500 by 2015. The potential supply of chiropractors for Michigan cannot be determined as there are no colleges of chiropractic medicine located in Michigan.

- **Dentists.** The demand for dentists in Michigan will grow by approximately 25% by 2015, from approximately 6,400 practicing dentists in 2000 to approximately 8,300 in 2015. Dentistry education in Michigan is provided at the University of Detroit – Mercy and the University of Michigan. At current graduation levels, the supply of dentists in Michigan will only slightly trail demand through 2010, but there will be a shortage of about 500 by 2015. The demand for dental services would be likely to grow even more if Medicaid reimbursements for dental services are increased, as this might lead to expanded dental services to the poor.
- **Optometrists.** The demand for optometrists in Michigan is similarly expected to grow by approximately 25% by 2015. The number of optometrists employed in Michigan, however, is relatively small, and total growth within this profession is expected to increase by less than 400, from 1,140 to approximately 1,500 in 2015. Optometry education is only offered at Ferris State University in Michigan, and the future supply of optometrists is forecasted to closely match future demand.
- **Pharmacists.** Although the growth of mail-order pharmacies has dampened some of the fiercest competition for retail pharmacists that was common over the past several years, the overall pharmacy vacancy rate in 2004 was still 5%, and vacancy rates for the four of every ten pharmacists who work in hospitals, government, or the military reach as high as 11%. Wayne State University’s reduction in upcoming pharmacy class size may reflect this trend. Nonetheless, the overall demand for pharmacists in Michigan is expected to continue growing between now and 2015, and the supply of new pharmacists graduating from Michigan universities will not keep up with this growth. The demand for pharmacists in Michigan is expected to grow from 7,200 in 2000 to approximately 9,400 by 2015. The supply of pharmacists in Michigan, however, is expected to decline slowly and dip below 7,000 between 2010 and 2015.

- Physician assistants. The number of physician assistants in Michigan is expected to grow steadily from 1,850 in 2000 to 2,400 in 2015 as the demand for “physician extenders” grows and as federally qualified health clinics, especially in rural areas, continue to find it difficult to recruit physicians. The demand for physician assistants in Michigan is expected to grow at about the same pace, and the supply of physician assistants may slightly exceed demand over the next ten years.
- Podiatrists. There were only 320 practicing podiatrists in Michigan in 2000, but with the growth of Michigan’s older population, demand for practitioners of podiatric medicine will increase to 415 by 2015. The future supply of podiatrists is unknown as there are no colleges of podiatric medicine located in Michigan.

Therapists

- Occupational therapists. As Michigan’s population ages, the demand for physical, occupational, and speech-language therapists (not included in this project) and other providers of rehabilitation services will grow. Based on the growth of Michigan’s older population, Michigan will need 5,000 occupational therapists by the year 2015. The supply of occupational therapists is expected to remain fairly steady at close to current levels over this entire time period, creating a shortage of more than 1,200 by 2015.
- Physical therapists. Michigan currently has approximately 5,000 physical therapists in clinical practice and the demand for physical therapists is expected to increase by about 1,500 by 2015. Michigan’s colleges and universities that offer physical therapy programs do not currently have the capacity to meet this growing need. Unless there are changes in the educational criteria for becoming a physical therapist or the practice of physical therapy changes in some way that increases productivity, there may be as few as 4,200 physical therapists practicing in Michigan by 2015.⁴

⁴ Physical therapy programs are increasingly offering a doctorate that, although not currently required for licensure or to practice, will likely become the professional standard, thus extending the length of time required to produce additional practitioners.

- Radiation therapists. Numbering fewer than 400 in 2000, the demand for radiation therapists in Michigan is expected to grow proportionately with the growth of the older population through 2015, when demand will be in excess of 450 practitioners. There are only 4 accredited programs in Michigan and at current capacity the supply of radiation therapists in Michigan will likely decline to slightly more than 300 by 2015.
- Respiratory therapists. The demand for respiratory therapists in Michigan will grow by approximately 900 by 2015. The supply of respiratory therapists is expected to keep up with demand through 2010 and drop off between 2010 and 2015, leaving a shortage of about 400.

Allied Health—Technicians and Technologists

- Cardiovascular technologists and technicians. Supply and demand patterns for cardiovascular technologists and technicians are similar to the supply and demand patterns for some therapist occupations and laboratory technicians and technologists. The demand for qualified practitioners will continue to grow over the next ten years, but there is relatively little capacity to educate enough technicians and technologists to meet this growing demand, and this shortfall will be dramatic. By 2015, the demand for cardiovascular technicians and technologists to treat the cardiac problems of an aging population may reach 2,400 with only half as many (1,200) practitioners available to fill these slots.
- Dental hygienists. The demand for dental hygienists in Michigan will grow in much the same manner as the demand for dentists who employ them. In 2000, there were approximately 6,600 dental hygienists working in Michigan, and this demand is expected to jump to 8,500 by 2015. The supply of dental hygienists is expected to keep up with demand for the next 5 years and then fall behind by more than 1,000 between 2010 and 2015.
- Diagnostic medical sonographers. At current rates of growth in demand and with only a small capacity to educate new sonographers at the present time in Michigan, there will be a significant shortage of practitioners in Michigan as early as 2010, when demand may exceed supply by 44%. However, some programs in diagnostic sonography may be missing from the data used for these calculations, thus possibly underestimating Michigan's capacity in

this profession. Nevertheless, even if capacity were actually twice as high as reported here, there would still be a shortage of diagnostic medical sonographers in Michigan.

- Emergency medical technicians (EMTs) and paramedics. There are currently 5,200 EMTs and paramedics in Michigan and the demand will grow as Michigan's population grows and ages. Demand may be as high as 6,700 by 2015, but supply will not be keeping up with demand and a shortfall of 30% or more could be evident by that time without additional recruitment.
- Medical and clinical laboratory technicians. Lab technicians will be in short supply over the next 10 years as demand grows by approximately 1,000 and the supply of qualified lab technicians declines by approximately the same amount.
- Medical and clinical laboratory technologists. Lab technologists will exhibit the same patterns of supply and demand as indicated for lab technicians. In this case, however, the magnitude of the figures is greater. Demand may grow by as much as 1,700 by 2015, and after accounting for retirements and other exits from this occupation, the shortfall could be as high as 2,800 by 2015.
- Licensed practical nurses (LPNs). The demand for LPNs in Michigan will likely increase by more than 5,000 by 2015. The supply of LPNs is projected to remain stable for a few years, but then begin to drop by 2007 as current training programs in Michigan fail to keep up with retirements, dropouts, and movement of LPNs into other health care occupations. From 2010 onward, it is expected that there will be a serious shortage of LPNs, possibly reaching a deficit of 5,600 by 2015.
- Medical records and health information technologists. Billers, coders, and other health information technologists are already in short supply, and the demand for this occupation will grow as the volume of health care encounters grows over the next decade. Standardization of billing forms and other health care documentation in the future could reduce much of this demand, but at the present time the demand for this occupation will grow by more than 1,500

by 2015. The supply of medical records and health information technologists in Michigan will remain much lower than needed for the foreseeable future. By 2015, the demand for billers and coders may reach 6,800 while the supply may only be 3,900, thus producing a shortage of 2,900.

- Nuclear medicine technologists. There were 650 nuclear medicine technologists working in Michigan hospitals and clinics in 2000. The demand for these technicians, who work closely with radiation therapists and oncologists, will increase by approximately 200 by 2015. The supply of nuclear medicine technicians will lag demand only slightly through 2010, but after that, the supply shortfall may grow as high as 200 or 25%.

- Pharmacy technicians. There are currently more than 8,000 pharmacy technicians in Michigan, and the demand for pharmacy technicians may exceed 10,000 by 2015 given the continuing growth in the older population and continuing growth in the number of pharmaceutical prescriptions that are filled each year. The supply of pharmacy technicians is not expected to grow, and the gap between supply and demand is predicted to widen considerably by 2015, when the shortfall could reach 50%.

- Radiological technicians and technologists. Radiological technicians and technologists continue to be in demand, although there are at least 20 hospital, college, and university radiology programs in Michigan. Demand is expected to grow from approximately 6,000 radiographers to approximately 8,000 by 2015. Supply is expected to hover around the 6,000 mark for most of this period. Some of the demand growth is likely to be for various advanced radiologic specialties including computed tomography (CT scans), magnetic resonance imaging (MRI), and mammography.

- Respiratory therapy technicians. Although there is expected growth in demand for respiratory technicians over the next decade, the supply of respiratory therapy technicians will be adequate. Both the supply and demand for respiratory therapy technicians in Michigan are expected to grow from less than 500 in 2000 to approximately 600 in 2015.

- Surgical technologists. The demand for surgical technologists will continue to grow through 2015, from 2,100 to approximately 2,800. Given the current availability of training and turnover, it is expected that there will be a surplus of qualified surgical technologists in Michigan during this entire period.

Health Care Support Occupations

- Dental assistants. As the demand for dentists and dental services grows over the next decade, there will be a commensurate growth in demand for dental assistants. Michigan will require an additional 3,000 dental assistants by 2015. The supply side of this issue is less promising, as there may be as few as 8,500 dental assistants for almost 14,000 positions. As many dental assistants work part time, however, some of this shortfall may be reduced by incumbents working longer hours.
- Medical assistants. The demand for medical assistants, primarily in physician offices and ambulatory-care facilities, will grow by approximately 30% between 2000 and 2015, from roughly 15,000 to 19,000. The supply of medical assistants is anticipated to grow slowly during this period to more than 16,000 by 2015.
- Occupational therapist (OT) assistants. The demand for OT assistants is predicted to grow only modestly, from 560 in 2000 to 700 in 2015. Training capacity in Michigan is currently more than adequate to meet that demand.
- Occupational therapist aides. The demand for OT aides will also grow modestly, from 240 in 2000 to 300 by 2015. There are currently no data available concerning the supply of OT aides in Michigan.
- Physical therapist (PT) assistants. There are more than seven times as many PT assistants as OT assistants currently working in Michigan, and the demand for qualified PT assistants will grow from approximately 1,800 in 2000 to about 2,300 in 2015. Current estimates indicate that there will be an adequate supply of PT assistants to fill these positions throughout this entire period.

- Physical therapist aides. The demand for PT aides is expected to increase from 1,500 in 2000 to approximately 1,900 in 2015. There are currently no data available concerning the supply of PT aides in Michigan.

Model Practices Research

So that each new venture does not have to reinvent processes, a selection of model practices was collected as part of the Health Care Workforce Development in Michigan project. These examples of practices that have been tried and tested were collected for the benefit of those who seek to address workforce development in health care. Model practice information was collected via several methods including literature reviews, Internet searches, key informant interviews, and site visits.

Often model practices were introduced through the suggestions of the Advisory Roundtable. Web sites to visit, publications to review, and individuals to contact were all mentioned to PPA staff. These included:

- Site visit to University of Detroit – Mercy to review their fast track second degree program.
- Site visit to the Michigan Works! Job Force Board to review their Health Care Roundtable.
- Interview with Jacqueline Hooper, D.P.H., Dean of Allied Health Programs, Ferris State University, Big Rapids, Michigan.
- Interview with Francine Boren-Gilkenson, Ph.D., Director of the Training and Upgrading Fund for 1199 SEIU/League Employment, Training & Job Security Program, New York, New York.
- Interview with Barbara Hoenig, CAEL/DOL Senior Program Director, Philadelphia, Pennsylvania.
- Informal conversation with Dr. Jean Moore, Center for Health Workforce Studies, State University of New York – Albany, School of Public Health, Rensselaer, New York.

- Interview with Jim Taylor, Dean of Allied Health Care, Kalamazoo Valley Community College, Texas Township, Michigan.
- Review of information collected by the Center for Health Workforce Studies, State University of New York – Albany.
- Review of information collected by the Center for Health Professions, University of California – San Francisco.
- Review of information collected by the National Governors’ Association, Center for Best Practices.
- Review of information collected by the American Hospital Association, AHA Commission on Workforce for Hospitals and Health Systems.

As each model practice was reviewed, it was classified into one of several major categories depending on the focus of the practice. In addition, each major category was broken down into several subcategories to narrow the focus of the practice. These categories are used as the index of the model practices report and include:

- Reduce turnover and vacancies among current professional health care staff
 - In-service training
 - Coaching and mentoring
 - Education assistance
 - Intradiscipline career advancement
 - Interdiscipline career advancement
 - Innovative education policies
 - Web-based education

- Health care mobility
 - Coaching and mentoring
 - Education assistance and leave
 - Innovative education policies
 - Web-based education

- Transitioning displaced workers
 - Skills development
 - Innovative education policies
 - Models of integration and coordination among WIA, colleges, and providers
 - Web-based education
 - Federal and state dislocated worker funds

- Attract and recruit future health care workforce
 - Postsecondary level
 - ◆ Partnership with schools and employers
 - ◆ Web-based education
 - Kindergarten through 12th grade level
 - ◆ Academic preparation in math and science
 - ◆ Information about career pathways
 - ◆ Job shadowing
 - ◆ Career/education development programs
 - ◆ Co-op programs with local health care providers
 - ◆ Outreach to parents, teachers, and counselors
 - ◆ Hands-on experiences
 - ◆ Parent, teacher, and counselor support

As the available literature was reviewed, many model suggestions were found. These were policies, practices, and ideas that had not yet been implemented. Suggestions of possible model practices were not included as part of this report; we have focused on those practices that might be possible to successfully replicate. With the assistance of the Advisory Roundtable to determine the most important information about each practice, the following aspects of each are described:

- Title of the model practice
- Location of the model practice
- Where information was found

- Where additional information can be found
- Description of the model practice
- Funding information

Each of these aspects was determined to be important if replication of the practice was to occur.

The model-practices listing that is reported here is by no means a complete and exhaustive list of practices that have been done and may be replicated. There are many additional avenues that could be pursued and constant updating and follow-up that can be done. It is the project team's hope that the model practices presented here can stimulate a variety of activities in the continued development of the health care workforce.

Conclusions and Recommendations

Conclusions

The data presented in the preceding sections along with the detailed information provided in the appendices confirm that there is extensive opportunity to expand Michigan's workforce in a number of relatively high-salary technical and professional occupations within Michigan's health care industry. In addition, there are well-documented workforce shortages in the health care sector that have been plaguing Michigan's health care industry for years, and efforts to increase the supply of qualified workers would help these employers and the communities in which they are located. Finally, this report has identified a number of strategies and tactics that have been successfully used in Michigan and elsewhere to expand the health care workforce and health care employment by stimulating interest among students and young people, by enhancing the skills and qualifications of current health care workers, and by retraining displaced workers for new careers in health care.

Occupations in Greatest Demand

Of the 30 occupational categories that were examined for this project, there are, or there will be, shortages in approximately two-thirds of the occupations over the next ten years. These

shortages are based on three fundamental assumptions: (1) that demand for health care services will continue to grow as the population grows and ages, (2) that current educational programs in Michigan for each of these occupations will be operating at full capacity over the entire 15-year period between 2000 and 2015, and (3) that there will be an overall shortage of new entrants to Michigan's labor force over the next decade. While the first assumption is very likely to be proved correct, the second assumption is unusually optimistic and may not prove to be true for each occupational category. If this is the case, the shortages in these occupational fields will be even greater than indicated in this report. On the other hand, these assumptions do not take into account the possibility that educational opportunities at Michigan colleges, universities, hospitals, and proprietary schools will expand over the next decade. If so, the shortages will likely be smaller than predicted here. The third assumption is a demographic reality that will mean more competition among industries for new workers in years to come.

- Licensed health care practitioners. Two occupational categories for which shortages have been widely publicized are nursing and pharmacy, and it is anticipated that both nursing and pharmacy will continue to exhibit significant gaps between supply and demand for at least the next decade.
 - Registered nurses. A wide spectrum of organizations—hospitals, schools of nursing, the news media, and nonprofits such as the Robert Wood Johnson Foundation—have been quite successful in recent years in publicizing the importance of nursing and in promoting the nursing profession. As a result, there have been recent increases in nursing school applications and enrollments in Michigan, and there have been a number of innovative programs to bring RNs back into the profession and to upgrade the skills of incumbent RNs. Currently, nursing schools in Michigan receive more applicants than they can enroll, and some nursing schools have waiting lists. All students in traditional undergraduate nursing programs do not, however, complete those programs. The proportion of nursing students who do not complete their program of study may be as high as 35%. This is attributed in part to inadequate preparation in mathematics and science among some of the students. Legislative efforts to mandate lower patient-to-nurse ratios than are presently found in hospital settings will also drive up the demand for

RNs if and when such legislation is ratified. Finally, although nursing schools have attempted to recruit more men and minorities, both men and minorities remain underrepresented in nursing and in nursing education in Michigan.

The most serious impediment to meeting the growing demand for RNs, however, is a lack of qualified instructors to teach nursing students. Nationwide, there is a nurse faculty vacancy rate of 8.6%. Nurses who teach in academic settings are aging and are not being supplemented or replaced by younger instructors. The median age of nursing instructors is about 51.5, according to the American Association of Colleges of Nursing (AACN), and a large portion of nursing faculty will be retiring within a decade. In addition, nurses with master's or doctoral degrees can usually make more money in bedside practice, nursing administration, or working for HMOs and insurance companies. There is also a shortage of trained preceptors in hospitals and other nursing sites that can provide the practical training and experience that accompanies the more traditional training in the classroom and laboratory. The Nursing Alliance of West Michigan has implemented a cooperative program in the Grand Rapids area to train bachelor's degree-prepared RNs to serve as preceptors in their own health care organizations.

The U.S. Department of Health and Human Services' Health Resources and Services Administration still anticipates a shortage of as many as 800,000 RNs across the nation by the year 2020. A shortage of approximately 14,000 registered nurses in Michigan by 2015 is likely.

- Pharmacists. Pharmacists have been in very short supply over the past few years as the volume of prescription pharmaceuticals has grown. In 2001, the National Association of Chain Drug Stores reported that 3 billion prescriptions were filled in the United States. They predict that this number will grow to 4 billion by 2006 (www.nacds.org). Despite growing utilization of mail-order pharmacies in Michigan (which have reduced demand) and greater educational requirements (e.g., Pharm.D. degree, which has slowed the supply of new pharmacists), Michigan's aging population and the growing reliance on pharmaceutical-based therapies for a growing number of ailments will continue to drive

the demand for pharmacists beyond the state's current capacity to train them. By 2015, Michigan could experience a shortage of as many as 2,800 pharmacists without any change in capacity, but the gap could be smaller as the retail provision of pharmaceuticals by mail and through the Internet reduces some of the growing demand for traditional pharmacists.

- **Therapists.** With the aging of the baby-boom generation, the need for most of the therapeutic professions will increase dramatically in Michigan. Most of these occupations require considerable postgraduate education including, in most cases, a full year of supervised clinical experience before licensure is attainable. By the year 2015, Michigan will have significant shortages of occupational, physical, and radiation therapists. It is also likely that there will be a significant shortage of speech-language pathologists, although this occupation was not included among the 30 occupations targeted for this project. There will also be a shortage of respiratory therapists after 2010, but this shortage will be minimal. It appears that respiratory therapy programs in Michigan have the capacity to meet most of the increased demand for respiratory therapists over the next decade, assuming that these programs run at full capacity and all of their candidates graduate.

- **Allied health—technicians and technologists.** The increased dependence on sophisticated technology by health care organizations and even individual physicians, dentists, and other health care practitioners has generated a growing need for personnel to operate these machines and provide technical services as part of a team approach to health care. As a result, there are several categories of health care technical occupations that did not exist a few decades ago, and new occupations are emerging on a regular basis. In Michigan, almost all of the allied health care technicians that were examined for this project will be in short supply over the next decade. These include:
 - Cardiovascular technicians
 - EMTs and paramedics
 - Laboratory technologists and technicians
 - Diagnostic medical sonographers

- Nuclear medicine technologists
- Radiological technologists and technicians
- Pharmacy technicians
- Surgical technologists
- LPNs

Technologist occupations (such as laboratory technologist) often require four years of college training while the other technical occupations listed above typically require only a year or two of postsecondary education. In some cases, training programs may even be provided internally by the larger health care systems. Several of these occupations are licensed, and certification through a national examination is required for job mobility and advancement in almost all cases.

Each of these occupations is absolutely essential for the information physicians and others need to diagnose and treat patients both inside and outside of the hospital setting. These positions pay relatively well, are generally quite stable, and they provide a variety of employment opportunities for individuals in each of the populations this project is targeting. The only negative aspect of these occupations—as with many of the occupations that directly or indirectly provide patient care—is that incumbents will be subject to shift work and weekend work.

One additional technical occupation that is not involved with patient care—medical records and health information technologists—is also in short supply. These individuals facilitate the flow of medical records and billing documents that allow health care organizations, individual practitioners, and health care insurers to operate. Barring any major change in the organization of the nation’s health care system over the next decade, the demand for “billers and coders” will continue to grow. If however, there is any sort of reorganization that reduces the thousands of health care insurance billing systems, contracts, insurance riders, and health plan limitations that currently exist, the demand for qualified professionals in this field will diminish. In addition, as the administrative costs of health care in the United States are estimated as high as 37% and provides a very attractive target for cost cutting through

standardization and automation (even without health care reform), the long-term prospects for health information technologists beyond 2015 may be less attractive than for those technicians and technologist who are directly involved in the care of patients.

- **Health care support occupations.** Six specific health care support occupations were identified for this project: medical and dental assistants, OT assistants and aides, and PT assistants and aides. Over the next ten years, there will be a serious shortage of both medical and dental assistants in Michigan unless the supply of individuals (who are almost exclusively women at the present time) can be expanded through recruitment, upgrading other workers, or training displaced workers to fill these slots. However, as there is no career ladder for most of these employees, competition from other occupations and incumbent turnover are likely to be ongoing problems.

The demand for therapists will be accompanied by a demand for formally trained support personnel to work under the direction of therapists (occupational and physical therapist assistants) along with less formally trained workers (occupational and physical therapist aides) to physically assist patients in therapy and attend to their personal needs. The supply of physical and occupational therapist assistants over the next ten years in Michigan will clearly not keep up with the growth in demand for these occupations. The demand for aides is also expected to grow, but the supply of aides is unknown, as these positions are not licensed or certified and formal training programs for these occupations were not identified.

Geographic Variations in Demand

Variations in the demand for health care professionals, technical workers, and support workers are primarily driven by population size, population density, and the presence or absence of medical facilities within the region. Larger and more densely populated regions, such as Detroit and Grand Rapids, have a higher concentration of health care providers and higher concentrations of health care workers than smaller and less densely settled areas such as the Upper Peninsula or several parts of northern Lower Michigan. With a few exceptions, fewer health care services are available in rural and thinly populated areas, but these areas, nonetheless, have as much or even greater difficulty in attracting an adequate supply of nurses and other

health care professionals and technicians that are needed to serve the existing facilities and residents in these areas. Thus, while the absolute demand for health care workers is proportionately greater in higher-population regions, the impact of recruiting, educating, and placing health care workers in Michigan's less well-served and rural areas will likely have a greater impact on the local economy and the growth of the local workforce.

Two other factors are also driving the demand for health care professionals and technicians in rural Michigan, especially many areas of northern Lower Michigan and the Upper Peninsula. While medically underserved areas may be found in both rural and urban Michigan, those in rural Michigan provide some unique opportunities for health care workers. Rural hospitals and federally qualified health clinics that provide primary care services may provide important employment opportunities for physician assistants and advanced-practice nurses, as these areas typically have the greatest difficulty in attracting adequate supplies of physicians. Moreover, rural Michigan—especially northern Lower Michigan—has experienced significant growth of retirees over the past two decades and, as is well known, older people are typically the largest consumers of health care services in our society. The popularity of moving to rural areas of Michigan, even if this is only for part of each year, has dramatically increased the demand for services in areas where relatively few facilities or practitioners are located.

Model Practices

There is no one best practice for promoting workforce development for all health care occupations, among a diverse group of target populations, or within a diversity of specific geographic locations. During the course of this project, the goal shifted from finding a single best practice for each situation to identifying a large number of model practices that have been implemented to address a wide variety of situations. Some of these practices have been designed for very specific populations, and some have been more successful than others. It also should be noted that much of the attention paid to health care occupations around the nation has focused more on nursing than other specific health care occupations. All of the examples cited, however, provide insight into a diverse set of approaches that may be useful to consider for any one of the occupational categories that has been targeted, within settings where shortages are most likely to occur, and with varying resources that may be applied to local efforts at workforce development.

Much of the information that has been gathered regarding model practices is devoted mainly to the recruitment and education of new entrants into the health care workforce. Programs in Michigan and throughout the nation have been identified that have expanded the awareness of high school and college students about health care careers, educated parents and school counselors about new and growing opportunities in health care, targeted underrepresented minorities for health care careers, and established distance learning and other innovative techniques for training allied health care workers in rural areas. Additional work needs to be done to identify a greater number of programs that specifically address the development of career ladders for incumbent health care professionals and technicians and that successfully address the transition of displaced workers in manufacturing or other industries into qualified health care professions. Examples of some of the model practices that have been identified are noted below.

- *Recruit and train new workers for health care occupations.* A large number of practices were identified from Michigan and around the nation that have been used to attract and facilitate entry of new workers into the health care industry. New York State has established a 20-hour core curriculum for CNAs that is transferable for training in other entry-level patient-care occupations. In California, the state rural health care association partnered with a college in northern California to provide distance learning for allied health care programs to 14 rural counties that could not sustain allied health care training programs on their own. Hospitals in and around Omaha, Nebraska, and Chapel Hill, North Carolina, respectively are providing scholarships to students in accelerated nursing programs in exchange for future work commitments at these hospitals. The state of Florida is supporting exploratory programs in nursing for middle school students through grants to school districts to encourage student interest in this career. Florida has also established a loan forgiveness program for nursing students. Around Fresno, California, 13 high schools, 2 community colleges, and an adult education provider have partnered to create “health academies” or “schools within schools” to promote careers in social work, medical technology, physical therapy, and other health care-related occupations. Allied health care students at California State University – Fresno served as allied health care ambassadors, mentoring students in the high school health academies. Also in California, Los Angeles Orthopaedic Hospital has

teamed up with the Los Angeles public school system to launch the Orthopaedic Hospital Medical Magnet School to train future medical professionals starting in the ninth grade. A similar project in New Jersey was promoted by the Pfizer Foundation, the Office of the Governor, and a local high school to establish a Medical Science Academy to foster interest in health care careers among high school students. This venture provides training and curriculum development for teachers, laboratory equipment, and interaction between students and working health care professionals. Community colleges and local hospitals are providing internship opportunities.

- *Facilitate career ladders and lateral career paths for incumbent workers in health care.* In Grand Rapids, Aquinas College, in cooperation with the University of Detroit – Mercy, is working with the West Michigan Nursing Advisory Council to train nurses with bachelor’s degrees to serve as preceptors who will oversee direct clinical training to nurses, simultaneously upgrading the skills of bedside nurses and supplementing nursing faculty who are in short supply. In Minnesota, Ridgewater College and regional health care providers formed a partnership to develop a workforce development model that would positively impact the educational and health care settings in their region. Their goal was to create a new way of educating, recruiting, and retaining workers. In Wyoming, hospitals have established a career ladder for CNAs by establishing a hospital-based program for CNAs who are on the job to obtain their nursing degrees. The Council for Adult and Experiential Learning (CAEL), in cooperation with the state of Maryland, the Maryland Hospital Association, and several other organizations, is starting to establish competency-based apprenticeships for both incumbent and newly hired workers to enter and advance in health care careers, including an LPN-to-RN path. This program allows incumbents to continue working while they learn, provides current workers with flexibility in receiving traditional didactic training, coordinates with local community colleges to oversee clinical training, and prepares the participants to take the NCLEX-RN exam. One of the largest programs in the nation for upgrading the skills of incumbent health care workers is sponsored by Service Employees International Union (SEIU) local 1199 in collaboration with employers and with educational institutions in the New York City area.

For the past 30 years, SEIU 1199 has managed a labor-management program that originally served exclusively as a means of channeling employer contributions to provide tuition grants for union members to attend college. Over the past three decades this program has expanded beyond college tuition and now focuses largely on upgrading the education and skills (including two-year and four-year college education) of workers at institutions and organizations where SEIU members are employed. Programs include training incumbent workers to gain new skills to fill shortages such as training kitchen workers to become medical billers or training CNAs to become radiographers or to enter into other technical occupations. Education is also provided at both the precollege level (GED, English as a second language, and college preparatory training) and at the college level where some health care workers are provided tuition benefits and, in some cases, full-time financial support to complete a degree in health care shortage occupations such as social work or pharmacy. In addition, SEIU 1199's experience indicates that career counseling is critical for individual success. SEIU 1199 provides career counseling for all students, and they require all students to participate.

SEIU 1199 serves approximately 30,000 of 70,000 eligible members (out of 120,000 total membership) each year at a cost in excess of \$100 million, most of which is obtained from federal and state grants and contracts. SEIU 1199 has experienced a 97% retention rate among union members in nursing programs, and 100% of those who are qualified to take the nursing exam have passed it. Of those attending college other than for nursing, approximately 70% have graduated. SEIU 1199's goal is to reach an 80% graduation rate among members whose education is supported.

- *Transition displaced workers to health care occupations.* Although one of the more critical tasks in developing a qualified workforce to fill some of the current and future health care workforce vacancies in Michigan is the establishment of programs to recruit and train displaced workers for health care careers, only a few programs have been identified that address this issue. Those displaced worker programs in health care that have been identified are mainly focused on basic-skills training in preparation for entry into health care careers

education. TANF (Temporary Assistance for Needy Families) funds have been used for some of these programs. The most extensive of these programs are offered by SEIU 1199 in New York in collaboration with local public schools, community colleges, and senior-level colleges. These institutions provide a variety of training opportunities for dislocated SEIU workers to acquire basic skills and training in a variety of allied health care occupations. As noted above, these workers are offered the opportunity while unemployed to enhance their precollege skills, if needed, as well as to participate in college-level training to qualify for jobs that are in demand. As with the programs that SEIU 1199 manages for upgrading incumbent workers, programs for dislocated workers are made possible by the collaboration of the union's Labor-Management Fund, employers, and educational organizations. Of particular importance is the need for flexibility in both the location and the scheduling of basic education and occupational training. The relatively large number of students who are educated through SEIU 1199-sponsored programs makes it possible for SEIU 1199 to negotiate with school districts and the City University of New York to provide many of the classes at times and locations that are most convenient for SEIU 1199 members. The executive director of this program also reported that, in some cases, SEIU 1199 works closely with local schools or colleges to hire its own qualified instructors and provide school- or college-sponsored educational services at the union's own facilities.

Other Considerations

Despite the accumulation of a large number of model practices that may serve as guides to activities that might be adopted to meet some of Michigan's specific health care workforce needs, there are some additional factors that may serve as underlying impediments to the successful adoption of many of these practices.

- *Faculty shortages.* One of the key impediments for all of the educational and training approaches that have been identified and may be recommended for use with all three target populations is the lack of adequate faculty to serve all of the students who wish to be educated. Interviews with nursing school administrators, for example, revealed that there are waiting lists for entry into nursing programs across the state. Recently there have been more applicants to nursing schools in Michigan than can be handled by these schools. This is, in

part, the result of successful efforts over the past few years to publicize the need for more nurses along with efforts to build public interest in and respect for nursing, such as the advertising campaign conducted by the Robert Wood Johnson Foundation. Nursing school administrators have reported in interviews with PPA staff that there are several underlying factors for this shortage. One is a shortage of nursing school faculty. As of March 2004, AACN reported an 8.6% nursing faculty vacancy rate across the nation. This is, in part, explained by greater financial opportunities for advanced-degree nurses in direct care or in administrative positions relative to the financial rewards for teaching. Specialist nurses with BSN degrees are paid roughly \$65,000 per year to work in patient care, and master's-prepared nurses can make that amount or more in hospital administration and a variety of other positions outside of direct care. In contrast, nurses with Ph.D.s and master's-prepared nurses who teach nursing students typically have salaries that are approximately 20% lower. As a result, United States nursing schools turned away nearly 16,000 qualified applicants to baccalaureate nursing programs in 2003. Conversations with nursing school administrators in both southeast Michigan and western Michigan indicated that they have had similar experiences. Also, as noted earlier, nursing faculty are aging and a substantial proportion of nursing faculty working today will likely retire within the next decade. Educational administrators have also reported shortages of qualified faculty for other health care occupations that is leading to, at best, the inability to expand health care occupation programs and, at worst, the elimination of entire programs.

For nursing education, there is also a shortage of preceptors who provide student nurses with direct, hands-on clinical experience in a hospital or long-term care facility. The Nursing Alliance of West Michigan has established a coalition of educational institutions and health care organizations to address this issue through establishment of local workshops for bachelor's-prepared nurses to acquire the appropriate skill sets that will allow them to serve as preceptors in their respective hospitals or other settings.

- *Financial impediments in allied health care education.* A second concern is that the cost of educating health care workers is relatively expensive, especially when compared to the typical liberal arts and humanities education provided by community colleges and four-year

colleges and universities. There are two reasons for this. First is the reliance of health care career training on a substantial amount of laboratory and hands-on training that requires the use of expensive equipment and more intense faculty interaction than is typically found in basic liberal arts and humanities. Second, some of these expenses are reinforced by licensure board rules as well as by the pragmatic reality that much of the curricula for these professions are most effectively taught to relatively small groups of students. In other words, most undergraduate training in health care occupations cannot be provided to large numbers of students in large lecture classes. One academic administrator interviewed for this project indicated that the cost per credit hour for health care occupation education at his institution was approximately four times or even five times the average cost per credit hour for all classes offered at his institution. Other administrators verified that the cost of the health care career offerings were typically several times the average cost of other academic offerings. Another administrator commented that the cost of providing this sort of education is the main reason that programs at individual colleges or universities are eliminated periodically and, more important, why the likelihood of colleges or universities in Michigan expanding or creating new health care career programs is quite low. While these administrators do not necessarily speak for all health care career educators in Michigan, both agreed that state subsidies will be needed if the capacity of these programs is to be expanded or if new programs are to be established to meet growing needs.

- *Professional limitations.* The licensure boards and professional organizations that oversee some health care professions have also pursued policies in recent years that may be either limiting or slowing the training of some new health care professionals. One example has been with regard to educational standards that have not, according to some educators, allowed greater flexibility in dealing with the shortage of qualified teaching staff. During the course of this project, it was reported that Michigan's Board of Nursing has reiterated its dictum that there be no more than ten students per faculty member in nursing educational programs, including preceptorships. As a result of this rule, even as interest in nursing has grown, the capacity of nursing education programs in Michigan to provide the hands-on practical experience on the nursing floor has been limited due to a lack of qualified bedside nurses to provide this training. As noted earlier, an extraordinary effort by hospitals, colleges

and universities, and others over several years has been needed to develop a training program for nursing preceptors in order to address this need. In contrast, one health care education administrator questioned whether allowing one instructor for 11 or 12 nursing students would have made a difference.

A second instance of professional board limitations on training was expressed by a health care occupations educational administrator who related his frustration in providing an off-campus, community-sponsored EMT training program. As his educational institution was only authorized to provide that training in one physical location—on the institution’s campus, any off-campus training provided would not be certified and students would not be qualified for licensure despite the fact that the program was provided with the same curriculum and by the same faculty.

Third, educational requirements for some health care professions have been expanded recently and, thus, require a longer period of training before candidates are entitled to take their licensure exams. Pharmacy programs in Michigan are transitioning to doctoral programs (Pharm.D.) that require an extra year of education. Physical therapists are increasingly being offered additional training leading to a Doctor of Physical Therapy degree. While this degree is not required to practice, students choosing this option will delay their entry into practice for an additional one to two years. Efforts to increase the educational and training requirements for these and other health care occupations will compound some of the shortages that are already evident.

Lessons Learned

Several very important lessons have been learned from this project that will help to frame subsequent efforts to create a larger and more highly trained health care workforce in the state of Michigan.

- Health care workforce development in Michigan should be inclusive of a wide variety of occupations, not just nursing. While the nursing workforce crisis in Michigan is widely recognized, significant shortages in other health care occupations—including most therapists

and therapist assistants, technologists and technicians, and health care support personnel—pose serious threats to Michigan’s health care delivery system and, as a result, provide great opportunities for recruiting, training, and placing new workforce cohorts in these positions.

- Health care workforce development will be a long-term effort. While some of the occupations identified in this report may be addressed through short-term recruitment and educational activities, the health care industry and the demand for health care professionals and technicians will continue to grow for the next 20 years as the baby-boom generation enters retirement age.
- Model practice solutions to the health care workforce crisis in Michigan span the entire range of age and career. Efforts to upgrade the skills of older, more-experienced incumbent health care workers and efforts to impart new skills and knowledge to displaced workers from other industries are as important in meeting the needs of Michigan’s health care industry as are the efforts to promote health care careers among young people.
- There is an enormous variety of model practices that have made an impact under varying circumstances, in different locations, and for a diversity of health care professions and occupations. Health care workforce development efforts need to include careful examination of a number of model practices in order to identify practices that may be best suited to specific local labor markets.
- The most successful programs identified through this effort are those that have established high levels of collaboration among key stakeholders, especially educational organizations, professional associations, and health care employers. This has been demonstrated in terms of both developing educational programs for students, such as those offered by SEIU 1199 in New York, and programs to develop additional faculty resources, such as the preceptor training effort by the West Michigan Nursing Advisory Council.
- Successful models exhibit flexibility in education and training—e.g., flexibility in location of educational and training programs, flexibility in scheduling of educational and training

programs, and flexibility in the administration of educational and training programs.

CAEL's health care occupations apprenticeship program in Maryland involves employers, professional organizations, and community colleges in competency-based professional education outside of traditional educational settings.

- Health care workforce development also means health care education faculty development. Despite the recent upswing in nursing school enrollment, efforts to broaden nursing education as well as education and training for other health care professions and occupations is being hindered by the shortage of qualified faculty to teach the next generation of health care workers.

- Health care workforce development also requires greater-than-average financial commitment. Health care professional and technical education is very expensive, especially because of the need for laboratory and clinical education as well as the relatively low student-to-faculty ratios that are required by some accrediting bodies. Employers, educators, labor unions, and government will have to collaborate on acquiring additional funding from innovative sources.

Recommendations

This project has been an important first step in addressing Michigan's interest in stimulating the growth of a highly trained and well-paid professional health care workforce while meeting the demand to address the health care industry's (and the public's) critical need for health care workers that are in short supply. One of the next major steps in aligning health care workforce development with Michigan's overall economic development strategy is to address the fragmentation of the health care workforce system at the regional level through the establishment of Regional Skill Alliances (RSAs). The information provided through this project can be an important source of technical support for the RSAs in their efforts to facilitate regional partnerships among health care employers, educators, professional associations, and workforce development organizations in order to grow Michigan's health care workforce.

Not all of the issues associated with stimulating the supply of qualified health care professionals and technicians in Michigan have been addressed yet. Nonetheless, this project has advanced this important effort in several significant ways. This project has identified critical health care occupations that will grow beyond Michigan's current ability to meet workforce demands and has identified the magnitude of this growth over the next ten years. This project has brought together critical information on the opportunities and rewards that are available to those who pursue these careers. Most important, this project has also identified a number of programs and practices that may be used to stimulate new interest in these careers, that can provide new education and career paths for workers already in the health care industry, and that may be used to help retrain workers from other industries who have skills and talents that may lead to success in new health care careers.

The following recommendations are offered in order to move the efforts of this project further along towards developing and implementing the policies that will be needed to significantly increase Michigan's health care workforce over the next 12 to 24 months.

- Maintain the Health Care Workforce Development in Michigan Advisory Roundtable and continue its work. This advisory group has provided extraordinarily valuable information about health care careers in Michigan through the exchange of information and the cross fertilization of ideas among key stakeholders who often do not come together on issues such as these.
- Use the materials produced by this project to provide information and technical support to RSAs that are targeting health care workforce issues in their respective regions.
- Use the materials produced through this project to provide Michigan Works! and workforce investment boards around the state with information and technical assistance in developing their own projects and programs to expand the health care workforce in their own areas.
- Establish a process to maintain and regularly update the profiles and the model practices databases and to periodically update the occupational forecasts so they will remain up to date

and useful tools for MDLEG and MDCH, for local workforce development agencies, for Michigan business and industry, and for individuals who are interested in pursuing health care careers.

- Add a health care careers database to MDLEG's Career Portal Web site (www.michigan.gov/careers) that will appeal to various levels and aspects of health care career research. This database will be based on the career profiles developed for this project (see Appendix B), including a description of the occupation, key employment and earnings statistics, occupational outlooks, professional associations, licensing requirements, educational requirements, and administrative rules regarding scope of practice. By placing this information on the Career Portal Web site, access to integrated health care career information will be made easier and continuously updatable.

- In order to monitor progress in addressing health care workforce shortage problems across Michigan, conduct a health care employer survey to track both regional and statewide vacancies and turnover for professional and nonprofessional health care occupations. This effort should be incorporated with the ongoing efforts of MDLEG's Labor Market Information division to track employment vacancies across all industries in Michigan.

- Determine the capacity of public and proprietary educational institutions and training organizations throughout Michigan to prepare health care practitioners and allied health care professionals, technologists, technicians, and assistants. In addition, determine the size of entering classes, graduating classes, and the number of qualified students turned away (if any) due to limited capacity.

- Use the information compiled through this initial project as the basis for applying for demonstration grants from the U.S. Department of Labor, other federal agencies, and private foundations and charitable organizations to fund implementation of programs that can be successfully applied to promoting health care occupations, educating students for health care careers, enhancing the skills and opportunities for health care workers, and meeting the workforce needs of health care providers throughout Michigan.

- Promote Michigan's participation in the Census Bureau's Local Employment Dynamics (LED) system. This new effort links employment (wage-record data) with traditional census data, thus allowing much more detailed and sophisticated analysis of local employment patterns along with the social and economic characteristics of members of the workforce within substate labor market areas.

- Develop a set of working committees composed of coalitions of key industry and professional stakeholders along with public agencies that will develop solutions to specific health care workforce issues in Michigan and then facilitate their implementation. Structurally, these working committees will coordinate their efforts with the Health Care Workforce Development in Michigan Advisory Roundtable. Operationally, each working committee will address a distinct aspect of health care workforce issues and will be comprised of individuals representing the most appropriate organizations, interests, and agencies for those concerns. Distinct working committees are suggested for the following:
 - Licensed health care professionals (including physicians, nurses, therapists, technicians, and others)
 - Nonlicensed professionals and other health care workers (including allied health care workers, nonlicensed technicians and technologists, and others)
 - Employers and labor (including health care organizations and organized labor organizations)

- Coordinate the policy decisions and the operational policies and plans developed through these efforts with the educational policies and plans under development by Lieutenant Governor Cherry's Commission on Higher Education in order to assure that Michigan's economic development, workforce development, and higher education policies are not established in isolation from or at cross purposes to each other.

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