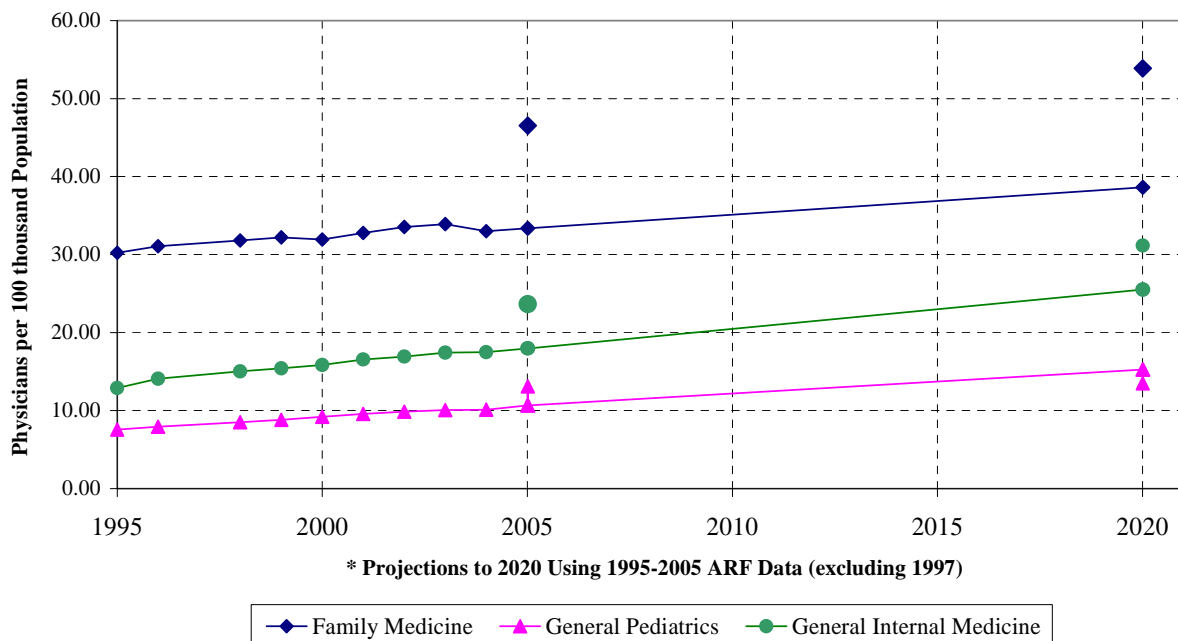


## ISSUE BRIEF:

# Indiana's Health Professions Workforce Shortages & Mal-distribution

**Figure 1: Primary Care Physician Supply in Indiana**  
**Showing Physician Demand Estimates for 2005 and 2020\***  
(Demand Estimates Shown as Points Off the Lines of Supply)



## WORKFORCE & WORKFORCE DEVELOPMENT SUBCOMMITTEE OF THE INDIANA UNIVERSITY HEALTH CARE REFORM STUDY GROUP

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# I. Problems Identified

## **PROBLEM A – HEALTH WORKFORCE SHORTAGES**

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Workforce shortages have been documented across a broad spectrum of health profession disciplines in Indiana. Currently, federal, state and local programs exist to recruit and retain health professionals in our state; however, these programs have had minimal impact on the underlying factors that contribute to the problem. Additional steps must be taken to expand the supply of health professionals to adequately meet the growing need for health care services among Indiana residents. While many health professional shortages exist, this brief will focus on the primary care physicians and nurses needed to provide medical homes for residents of our state.

- We currently need 5,000 more physicians statewide—1,000 of whom need to be primary care physicians—to appropriately care for the population.
- By 2020, we will need 2,000 additional primary care physicians to meet the health care needs of the Indiana population if current trends continue.
- Only 19% of urban counties and 2% of rural counties in Indiana met the US benchmark for the number of primary care specialists.
- There were 6,000 unfilled Registered Nurse positions in hospitals alone in the first quarter of 2007.
- By 2020, we will be short 20,000 Registered Nurses in Indiana if current trends continue.
- Only 35% of urban counties and 13% of rural counties in Indiana met the US benchmark for the number of Registered Nurses.
- Half (54%) of Indiana counties are designated as Medically Underserved Areas in whole or in part.
- 38% of Indiana counties are designated Mental Health Professional Shortage Areas representing 1,097,313 individuals or 17.5% of the state’s population.
- 30% of Indiana counties are designated Primary Care Health Professional Shortage Areas, where 836,638 individuals or 13.4% of the state’s population reside.
- 14% of Indiana counties are designated Dental Health Professional Shortage Areas, affecting 505,696 individuals or 8.1% of the state’s population.<sup>1</sup>

Projections indicate that shortages will continue to worsen in the future due to:

- Growth of the Indiana population
  - 14% growth from 1980 to 2005
- Aging of the Indiana population
  - Those over age 65 will double between 2000 and 2030
  - Those over age 65 make twice as many physician visits compared to those under age 65
  - Major and chronic illnesses are much more prevalent among those over age 65
- Public expectations
  - Baby boomers have more resources
  - Baby boomers have higher expectations and value physicians
- Life style factors – rates of obesity, diabetes, etc. are rising very fast
- Advances in medicine will likely increase service demand
- Low growth of health professions training programs

- Aging of the health professions workforce – partial and full retirements
  - According to a recent study in Indiana, among the “critical aging occupations” is Associate’s degreed nurses and Associate-level teachers and instructors.<sup>2</sup> The aging workforce in the health professions has been demonstrated as one environmental factor that accounts for the current and future shortage predictions in many national reports.<sup>3-5</sup>
- Gender and generational differences in hours spent providing care
- Federal and state policies restrict immigration of foreign trained health professionals

*Table 1 – Comparison of Indiana’s Projected Physician Supply by Specialty to 2020 Demand*

Table 1 projects the number of primary care physicians, by type, that are expected to be practicing in Indiana in 2020, based on historical trends. This projection does not include the additional medical students that are currently being accepted into the IU Medical School (IUSM) for the year 2007 matriculating class. The expansion of the medical school classes will begin to have an effect in seven years (four years of medical school plus three years of residency), so the first group of 15 additional students should be ready to start practicing in the year 2015. Since about one half of the medical school graduates exit Indiana to practice, and only about 40% of the graduates choose primary care specialties, it is expected that the expansion of the medical school classes will have minimal impact on the total number of practicing primary care physicians in the state of Indiana by 2020. Considering the expected population growth and the anticipated increase in demand, it is projected that approximately 1,900 primary care physicians will be needed to meet the benchmark ratios per 100,000 in the year 2020.

*Figure 1 (shown on cover) – Primary Care Physician Projections*

Based on Area Resource File data from 1995 to 2005, projections for the three major primary care specialties are shown in Figure 1. The single points above the lines in 2005 and 2020 are the benchmark ratios for each specialty needed to meet the health care needs of the population. The 1997 data appeared to be an outlier and was not included. The projections for these specialties are being made in the middle of major changes occurring in the educational matrix of primary care; thus, conclusions about the projections should be made with caution.

- The number of Family Medicine (FM) residency slots in Indiana continues to drop, so we are not educating as many FM residents as we have in the past
- Almost 60% of those residents entering FM residencies across the country and in Indiana are International Medical Graduates (IMGs) and we do not yet know what impact that will have on their eventual practice site. Changes in the US Immigration policies following 9/11 have affected the number of IMGs who come to the US for training and stay in the US to practice.
- Almost 40% of the residents entering Internal Medicine (IM) and Pediatrics residency programs are IMGs and the same issues apply.
- There is increasing dissatisfaction among physicians with the current medical system and primary care physicians are retiring earlier. Others are electing to work fewer hours than was the case in the past.
- The increase in the class size of the IUSM will not have full impact until 2011-12 when all 80 new students will have entered IUSM. It will take 7 years for them to complete medical school and a primary care residency (year 2019). Using the current trends that 10% of graduates enter into Family Medicine per year, 30% will enter Pediatrics or

General Internal Medicine, and nearly one-half will elect to practice out of state. It is expected that the medical school class expansion will add about 16 new residents practicing in primary care specialties from 2019 and onward. This assumes no major decline or increase in student interest during this time.

*Figure 2 – Nurses Projections*

Figure 2 shows the expected decline in the Registered Nurse workforce and the increasing demand for Registered Nurses in Indiana, based on sophisticated modeling performed by the US Health Resources and Services Agency, Bureau of Health Professions, and reported in “Projected Supply, Demand, and Shortages of Registered Nurses: 2000-2020”.<sup>3</sup> The numbers shown on the graph are ratios of nurses per 100,000 population. Based on these numbers and the projected number of Indiana residents, the shortage of Registered Nurses in 2005 was 5,660, which is a little over twice the number of open nursing positions in Indiana hospitals reported by the Indiana Hospital and Health Association for the first quarter of 2007.<sup>6</sup> With the current trends, the estimated shortage of Registered Nurses in Indiana by 2020 will be 22,076.

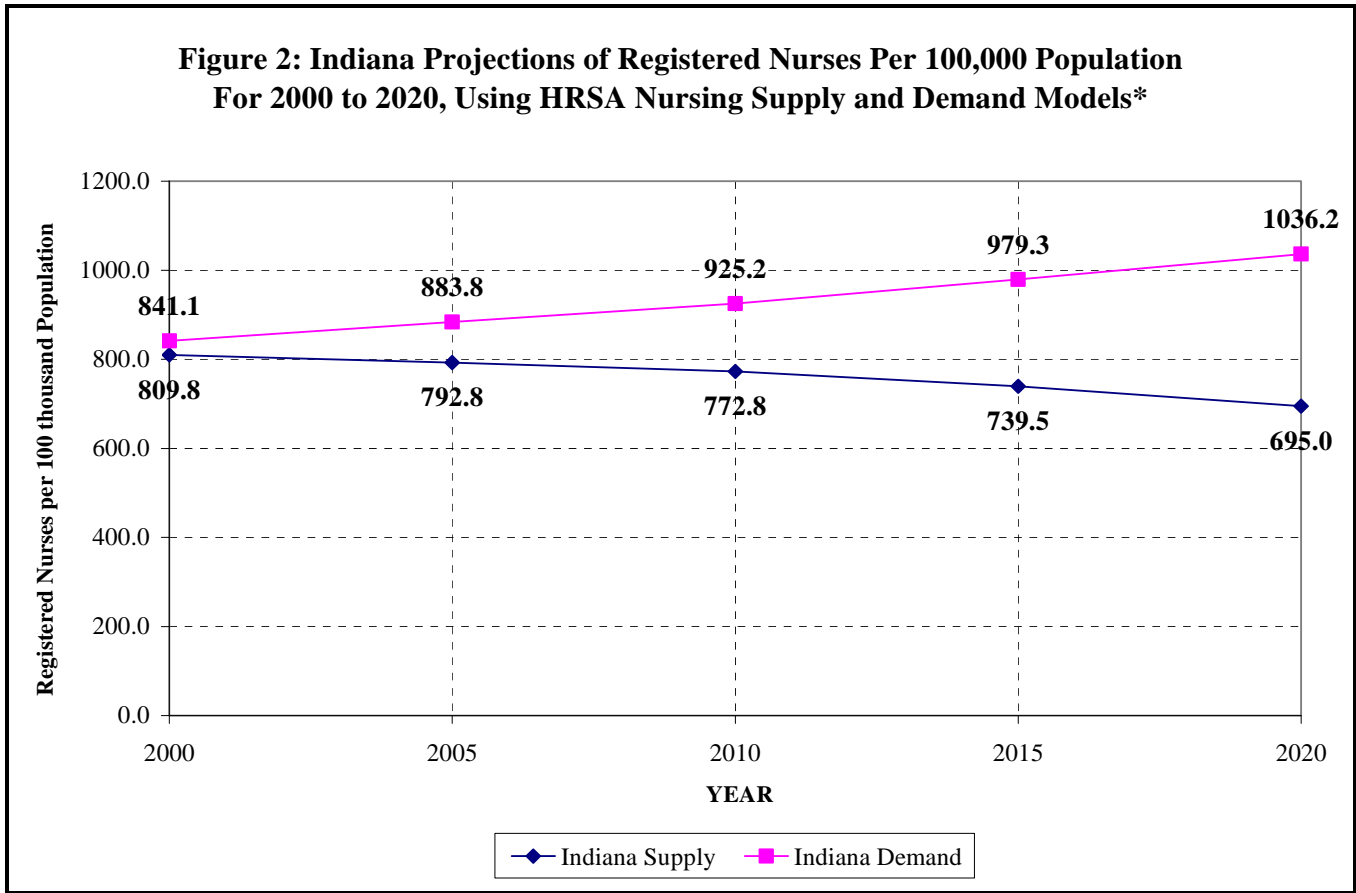
**Table 1: Comparison of Indiana's Projected Physician Demand and Supply By Specialty, 2020**

| <b>SPECIALTY</b>                | <b>PROJECTED TOTAL NUMBER IN STATE</b> | <b>INDIANA PHYSICIAN SUPPLY (BY SPECIALTY) [per 100,000 Indiana citizens]</b> | <b>Lifton 2020 PHYSICIAN DEMAND [per 100,000 Indiana citizens]*</b> | <b>DIFFERENCE BETWEEN INDIANA PHYSICIAN SUPPLY &amp; DEMAND RATIOS</b> | <b>NUMBER OF PHYSICIANS NEEDED</b> |
|---------------------------------|--|---|---|--|------------------------------------|
| Family Medicine                 | 2560                                   | 38.6  | 53.9  | 15.3   | 1030                               |
| General Internal Medicine       | 1691                                   | 25.5  | 31.2  | 5.7  | 383                                |
| General Pediatrics              | 1011                                   | 15.3  | 13.5  | -1.8   | -118                               |
| General Obstetrics & Gynecology | 769                                    | 11.6  | 14.3  | 2.7  | 182                                |
| General Surgery                 | 355                                    | 5.4   | 11.6  | 6.2  | 421                                |
| <b>TOTAL</b>                    | <b>6386</b>                            |   |   |  | <b>1898</b>                        |

Source: <sup>7,8</sup>

\*All specialties adjusted for differences between Indiana and US service delivery models

**Figure 2: Indiana Projections of Registered Nurses Per 100,000 Population For 2000 to 2020, Using HRSA Nursing Supply and Demand Models\***



\*Source: <sup>9</sup>

**PROBLEM B – COMPOSITION AND DISTRIBUTION OF THE HEALTH WORKFORCE**

The health professions workforce shortages are more acute for specific health professionals in designated geographical areas. A study commissioned by the Indiana State Office of Rural Health to examine existing rural recruitment and retention programs for health workforce found that federal, state and local programs do exist to recruit and retain health professionals where they are needed; however, these programs have not had the expected impact on addressing this problem given their current implementation.<sup>10</sup> A review of effective strategies reveals that the impacts of these programs may be improved by using existing evidence about what kinds of students ultimately serve in needed primary care health professions disciplines in areas of need.

According to a Price Waterhouse report, nurse and physician roles are blurring in primary care. In many areas of the country, non-physician providers help fill the need for primary care when physicians are not available. Of hospital executives surveyed, three-fourths said they use more non-physician primary care providers now than in the past and over half said they will use them more in the future.<sup>11</sup> However, in Indiana, there are insufficient numbers of non-physician primary care providers to fill the gap caused by the shortage of primary care physicians.

## **Composition of Health Professions Workforce**

Primary and preventive health care include services such as immunizations, treatment of minor infections before they become more severe, well child care, screening services to identify potential health issues early when it is most cost-effective to treat them, management of chronic health conditions, and basic and accurate health information to help individuals manage their own health. Providers of primary and preventive care include primary care physicians, nurse practitioners, public health nurses, and physician assistants, as well as mental health providers and dentists. Many other health professional disciplines are needed to support these primary care providers. If one of the goals of health care reform is to improve health and reduce costs of health care, then a more appropriate balance of primary care and specialty care provider ratios is needed to ensure adequate access to primary care preventive services.

*“Analyses at the county level show lower mortality rates where there are more primary care physicians, but this is not the case for specialist supply. These findings confirm those of previous studies at the state and other levels. Increasing the supply of specialists will not improve the United States’ position in population health relative to other industrialized countries, and it is likely to lead to greater disparities in health status and outcomes. Adverse effects from inappropriate or unnecessary specialist use may be responsible for the absence of relationship between specialist supply and mortality.”<sup>12</sup>*

In Indiana, primary and preventive care is more likely to be provided by Family Medicine physicians than in the US in general, as evidenced by the higher ratio of Family Medicine physicians per 100,000 population and lower ratio of General Internal Medicine physicians per 100,000 population in Indiana, compared to the US as a whole. In addition, it has been postulated that many rural areas with low population density may not have a sufficient number of individuals to support both a General Internal Medicine physician and a Pediatric physician, but may be able to support a Family Medicine physician.

## **Distribution of the Health Professions Workforce**

Many communities across the state experience a shortage of health professionals in virtually all disciplines, from medical assistants to medical doctors. Many of the communities with the most serious shortages also experience the most poverty and the poorest health status. These communities increase the health care cost in our state because the individuals in those communities tend to wait to access healthcare until it is urgent and tend to access healthcare in the most expensive and least effective way -- through hospital emergency rooms. The costs incurred in this fashion are often covered by Medicaid, resulting in an increased tax burden, or remain uncompensated to the hospitals, resulting in unavoidable shifting of costs, which increases medical premiums for businesses and their employees.

These medically underserved communities, which suffer from health professional shortages, can exist anywhere, but tend to be concentrated in our rural communities and our urban inner city areas where there are economically disadvantaged individuals. Despite the poverty in these areas that may make the communities appear unattractive to some health professionals, evidence shows that there are many strategies to recruit students to ultimately practice in medically underserved communities.<sup>13</sup>

Evidence shows that the strongest predictor of where a health professional will practice is where that health professional came from, validating the supposition that those who practice in medically underserved communities are most likely to have come from underserved populations. However, evidence also shows that students from underserved backgrounds are less likely to enter higher education and health professions training programs than their economically advantaged counterparts, unless they are equipped to overcome the educational and financial barriers that they face.<sup>14, 15</sup>

The supply of health professionals varies greatly based on certain geographic, demographic and socioeconomic factors resulting in a mal-distribution of health professionals across the state of Indiana. Health professionals are more likely to be concentrated in areas of economic affluence and less likely to be concentrated in areas where the population is less dense. These are also areas where the population has higher proportions of low income and racial and ethnic minorities.<sup>16-20</sup> Medically underserved populations suffer disproportionately from poorer health status and higher health care costs because of their lack of access to primary and preventive care. These disparities are due to many factors, but are certainly due in part to lack of health coverage and an insufficient numbers of providers. Disparities are most prevalent in Indiana's urban inner cities and rural areas.

*Table 2- Primary Care Physicians and Non-Physician Clinicians in Indiana by County*

Table 2 shows that counties that are not classified as Metropolitan Statistical Areas (MSAs) have lower ratios of primary care physicians and non-physician clinicians per population than those classified as MSAs. The table also shows a great deal of variation among counties relative to the composition of the primary care clinician workforce. Family Medicine physicians are by far the most common primary care clinicians in non-MSA counties. Counties with very low numbers of Family Medicine physicians are more likely to have Nurse Practitioners supporting the primary care needs of the communities than those counties with more Family Medicine physicians per population. Osteopathic physicians and Primary Care Physician Assistants are not prevalent in Indiana's counties. General Internal Medicine physicians and General Pediatric physicians are less prevalent in non-MSA counties. There is a close relationship between population density and the composition of the primary care clinician workforce.

*Map 1- Primary Care Provider to Population Ratios by County*

Map 1 shows the ratio of Primary Care Providers, both physician and non-physician, practicing in the county per 100,000 population for the 92 Indiana Counties. At this time a benchmark ratio for adequate numbers of primary care providers per 100,000 population has not been established. Residents in counties with lighter shading have fewer practicing primary care providers per capita from whom they could seek health care. The map illustrates the wide range of ratios in Indiana from 0/100,000 in Ohio County to 188.2/100,000 in Boone County

*Map 2- Nurse to Population Ratios by County*

Map 2 shows the ratio of Registered Nurses working in the county per 100,000 population in the 92 Indiana Counties. Those counties with the two lighter shades have Registered Nurse ratios less than the HRSA benchmark. Those counties with the middle shade have ratios near the HRSA benchmark. Those with the two darker shades have ratios above the HRSA benchmark. The map illustrates that most Indiana counties fall below the HRSA benchmark.

**Table 2: Primary Care Physicians and Non-Physician Clinicians in Indiana by County**

| MSA † | Year 2005 Population | County      | Primary Care Physicians & Non-Physician Clinicians |                                      |                              |                         |                                   |                      | Primary Care Totals & Ratios                             |   |                                   |
|-------|----------------------|-------------|--|--------------------------------------|------------------------------|-------------------------|-----------------------------------|----------------------|--|---|-----------------------------------|
|       |                      |             | Family Medicine Physicians                         | General Internal Medicine Physicians | General Pediatric Physicians | Osteopathic Physicians* | Primary Care Physician Assistants | Nurse Practitioners* | TOTAL Primary Care Physicians & Non-Physician Clinicians | RATE of Primary Care Physicians & Non-Physician Clinicians per 100,000 population | Relative Score on 100 point scale |
| 2     | 33849                | Adams       | 11   | 2                                    | 0                            | 0                       | 0                                 | 3                    | 16   | 47.3  | 25.1                              |
| 1     | 344006               | Allen       | 111  | 43                                   | 31                           | 67                      | 8                                 | 83                   | 343  | 99.7  | 53.0                              |
|       | 73540                | Bartholomew | 30   | 19                                   | 15                           | 3                       | 1                                 | 14                   | 82   | 111.5   | 59.2                              |
|       | 9039                 | Benton      | 3  | 0                                    | 0                            | 0                       | 0                                 | 2                    | 5  | 55.3  | 29.4                              |
|       | 13849                | Blackford   | 6  | 2                                    | 0                            | 0                       | 0                                 | 2                    | 10   | 72.2  | 38.4                              |
| 2     | 52061                | Boone       | 28   | 28                                   | 19                           | 13                      | 2                                 | 8                    | 98   | 188.2   | 100.0                             |
|       | 15154                | Brown       | 5  | 1                                    | 1                            | 2                       | 0                                 | 4                    | 13   | 85.8  | 45.6                              |
|       | 20426                | Carroll     | 6  | 0                                    | 0                            | 1                       | 0                                 | 5                    | 12   | 58.7  | 31.2                              |
|       | 40130                | Cass        | 11   | 4                                    | 3                            | 3                       | 0                                 | 4                    | 25   | 62.3  | 33.1                              |
| 1     | 101592               | Clark       | 24   | 23                                   | 9                            | 7                       | 3                                 | 20                   | 86   | 84.7  | 45.0                              |
| 2     | 27142                | Clay        | 6  | 3                                    | 1                            | 2                       | 3                                 | 2                    | 17   | 62.6  | 33.3                              |
| 2     | 34091                | Clinton     | 6  | 2                                    | 2                            | 1                       | 0                                 | 3                    | 14   | 41.1  | 21.8                              |
|       | 11216                | Crawford    | 0  | 0                                    | 0                            | 0                       | 0                                 | 2                    | 2  | 17.8  | 9.5                               |
|       | 30466                | Daviess     | 4  | 3                                    | 2                            | 10                      | 0                                 | 9                    | 28   | 91.9  | 48.8                              |
| 2     | 41659                | De Kalb     | 20   | 2                                    | 1                            | 4                       | 1                                 | 3                    | 31   | 74.4  | 39.5                              |
| 2     | 49082                | Dearborn    | 10   | 9                                    | 8                            | 4                       | 0                                 | 1                    | 32   | 65.2  | 34.6                              |
|       | 25184                | Decatur     | 2  | 3                                    | 2                            | 1                       | 1                                 | 3                    | 12   | 47.6  | 25.3                              |
| 1     | 116362               | Delaware    | 44   | 37                                   | 13                           | 10                      | 1                                 | 29                   | 134  | 115.2   | 61.2                              |
|       | 40858                | Dubois      | 15   | 9                                    | 4                            | 11                      | 1                                 | 5                    | 45   | 110.1   | 58.5                              |
| 1     | 195362               | Elkhart     | 59   | 18                                   | 14                           | 31                      | 5                                 | 32                   | 159  | 81.4  | 43.2                              |
|       | 24885                | Fayette     | 7  | 3                                    | 2                            | 4                       | 0                                 | 6                    | 22   | 88.4  | 47.0                              |
| 1     | 71997                | Floyd       | 32   | 6                                    | 13                           | 2                       | 1                                 | 8                    | 62   | 86.1  | 45.8                              |
|       | 17462                | Fountain    | 3  | 1                                    | 0                            | 0                       | 0                                 | 0                    | 4  | 22.9  | 12.2                              |
|       | 23085                | Franklin    | 1  | 2                                    | 0                            | 0                       | 2                                 | 1                    | 6  | 26.0  | 13.8                              |
|       | 20665                | Fulton      | 6  | 1                                    | 3                            | 3                       | 1                                 | 4                    | 18   | 87.1  | 46.3                              |
|       | 33408                | Gibson      | 6  | 3                                    | 1                            | 9                       | 1                                 | 3                    | 23   | 68.8  | 36.6                              |
|       | 70557                | Grant       | 17   | 9                                    | 4                            | 18                      | 1                                 | 10                   | 59   | 83.6  | 44.4                              |
|       | 33479                | Greene      | 8  | 0                                    | 0                            | 3                       | 0                                 | 5                    | 16   | 47.8  | 25.4                              |
| 1     | 240685               | Hamilton    | 107  | 104                                  | 56                           | 41                      | 8                                 | 36                   | 352  | 146.2   | 77.7                              |
| 2     | 63138                | Hancock     | 31   | 7                                    | 4                            | 5                       | 0                                 | 12                   | 59   | 93.4  | 49.7                              |
| 2     | 36827                | Harrison    | 13   | 2                                    | 2                            | 1                       | 0                                 | 4                    | 22   | 59.7  | 31.7                              |
| 2     | 127483               | Hendricks   | 32   | 17                                   | 17                           | 17                      | 3                                 | 9                    | 95   | 74.5  | 39.6                              |
|       | 47244                | Henry       | 13   | 4                                    | 3                            | 0                       | 0                                 | 8                    | 28   | 59.3  | 31.5                              |
| 1     | 84977                | Howard      | 28   | 18                                   | 9                            | 6                       | 2                                 | 13                   | 76   | 89.4  | 47.5                              |
| 2     | 38236                | Huntington  | 13   | 2                                    | 7                            | 3                       | 0                                 | 2                    | 27   | 70.6  | 37.5                              |
|       | 42237                | Jackson     | 22   | 1                                    | 2                            | 1                       | 3                                 | 6                    | 35   | 82.9  | 44.0                              |
|       | 31876                | Jasper      | 15   | 2                                    | 0                            | 1                       | 0                                 | 4                    | 22   | 69.0  | 36.7                              |
|       | 21606                | Jay         | 7  | 1                                    | 0                            | 1                       | 0                                 | 2                    | 11   | 50.9  | 27.1                              |
|       | 32430                | Jefferson   | 17   | 3                                    | 3                            | 2                       | 1                                 | 3                    | 29   | 89.4  | 47.5                              |
|       | 28427                | Jennings    | 5  | 4                                    | 1                            | 3                       | 0                                 | 6                    | 19   | 66.8  | 35.5                              |
| 1     | 128436               | Johnson     | 49   | 26                                   | 20                           | 8                       | 0                                 | 15                   | 118  | 91.9  | 48.8                              |
|       | 38366                | Knox        | 10   | 10                                   | 4                            | 14                      | 0                                 | 8                    | 46   | 119.9   | 63.7                              |
|       | 76072                | Kosciusko   | 29   | 2                                    | 4                            | 13                      | 4                                 | 7                    | 59   | 77.6  | 41.2                              |
|       | 110512               | La Porte    | 34   | 19                                   | 8                            | 10                      | 0                                 | 17                   | 88   | 79.6  | 42.3                              |
|       | 36875                | Lagrange    | 8  | 1                                    | 0                            | 2                       | 0                                 | 1                    | 12   | 32.5  | 17.3                              |
| 1     | 493297               | Lake        | 121  | 103                                  | 62                           | 95                      | 0                                 | 70                   | 451  | 91.4  | 48.6                              |
|       | 46403                | Lawrence    | 10   | 9                                    | 4                            | 2                       | 0                                 | 7                    | 32   | 69.0  | 36.6                              |
| 1     | 130412               | Madison     | 59   | 10                                   | 8                            | 1                       | 0                                 | 17                   | 95   | 72.8  | 38.7                              |



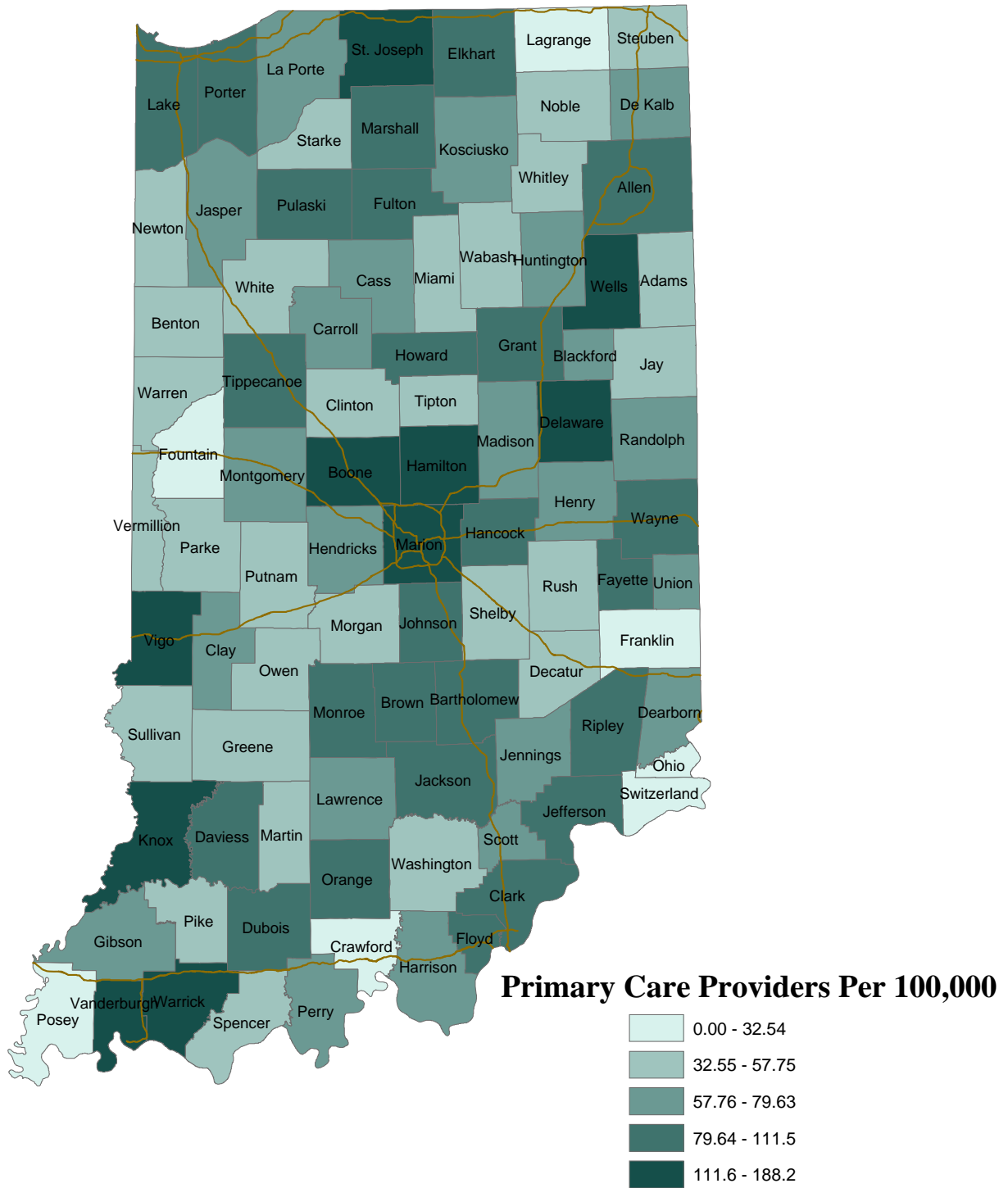
| MSA <sup>†</sup> | Year 2005 Population | County      | Primary Care Physicians & Non-Physician Clinicians |                                      |                              |                         |                                   |                      | Primary Care Totals & Ratios                             |   |                                   |
|------------------|----------------------|-------------|--|--------------------------------------|------------------------------|-------------------------|-----------------------------------|----------------------|--|---|-----------------------------------|
|                  |                      |             | Family Medicine Physicians                         | General Internal Medicine Physicians | General Pediatric Physicians | Osteopathic Physicians* | Primary Care Physician Assistants | Nurse Practitioners* | TOTAL Primary Care Physicians & Non-Physician Clinicians | RATE of Primary Care Physicians & Non-Physician Clinicians per 100,000 population | Relative Score on 100 point scale |
| 1                | 863133               | Marion      | 277  | 249                                  | 160                          | 108                     | 20                                | 358                  | 1172   | 135.8   | 72.1                              |
|                  | 46945                | Marshall    | 25   | 1                                    | 1                            | 11                      | 0                                 | 7                    | 45   | 95.9  | 50.9                              |
|                  | 10386                | Martin      | 1  | 2                                    | 0                            | 2                       | 0                                 | 1                    | 6  | 57.8  | 30.7                              |
|                  | 35620                | Miami       | 6  | 2                                    | 3                            | 3                       | 0                                 | 4                    | 18   | 50.5  | 26.9                              |
| 1                | 121407               | Monroe      | 47   | 24                                   | 12                           | 6                       | 4                                 | 36                   | 129  | 106.3   | 56.5                              |
|                  | 38239                | Montgomery  | 13   | 4                                    | 4                            | 2                       | 0                                 | 7                    | 30   | 78.5  | 41.7                              |
| 2                | 69778                | Morgan      | 10   | 10                                   | 4                            | 7                       | 1                                 | 4                    | 36   | 51.6  | 27.4                              |
|                  | 14456                | Newton      | 1  | 1                                    | 0                            | 1                       | 0                                 | 3                    | 6  | 41.5  | 22.1                              |
|                  | 47448                | Noble       | 15   | 2                                    | 1                            | 1                       | 0                                 | 2                    | 21   | 44.3  | 23.5                              |
| 2                | 5874                 | Ohio        | 0  | 0                                    | 0                            | 0                       | 0                                 | 0                    | 0  | 0.0   | 0.0                               |
|                  | 19770                | Orange      | 11   | 0                                    | 1                            | 2                       | 0                                 | 3                    | 17   | 86.0  | 45.7                              |
|                  | 22823                | Owen        | 3  | 2                                    | 0                            | 0                       | 1                                 | 2                    | 8  | 35.1  | 18.6                              |
|                  | 17362                | Parke       | 7  | 0                                    | 0                            | 0                       | 0                                 | 1                    | 8  | 46.1  | 24.5                              |
|                  | 19032                | Perry       | 8  | 1                                    | 1                            | 1                       | 0                                 | 1                    | 12   | 63.1  | 33.5                              |
|                  | 12766                | Pike        | 3  | 0                                    | 0                            | 0                       | 0                                 | 2                    | 5  | 39.2  | 20.8                              |
| 2                | 157772               | Porter      | 41   | 31                                   | 11                           | 30                      | 1                                 | 20                   | 134  | 84.9  | 45.1                              |
| 2                | 26852                | Posey       | 5  | 0                                    | 0                            | 1                       | 0                                 | 0                    | 6  | 22.3  | 11.9                              |
|                  | 13783                | Pulaski     | 6  | 0                                    | 0                            | 3                       | 0                                 | 3                    | 12   | 87.1  | 46.3                              |
|                  | 36957                | Putnam      | 12   | 3                                    | 0                            | 0                       | 1                                 | 1                    | 17   | 46.0  | 24.4                              |
|                  | 26684                | Randolph    | 5  | 3                                    | 0                            | 3                       | 0                                 | 6                    | 17   | 63.7  | 33.9                              |
|                  | 27710                | Ripley      | 10   | 3                                    | 5                            | 2                       | 1                                 | 2                    | 23   | 83.0  | 44.1                              |
|                  | 17823                | Rush        | 4  | 3                                    | 0                            | 1                       | 0                                 | 2                    | 10   | 56.1  | 29.8                              |
| 2                | 23820                | Scott       | 9  | 1                                    | 1                            | 0                       | 0                                 | 6                    | 17   | 71.4  | 37.9                              |
| 2                | 43766                | Shelby      | 8  | 6                                    | 1                            | 1                       | 0                                 | 2                    | 18   | 41.1  | 21.9                              |
|                  | 20528                | Spencer     | 7  | 0                                    | 0                            | 0                       | 0                                 | 1                    | 8  | 39.0  | 20.7                              |
| 1                | 266160               | St. Joseph  | 113  | 43                                   | 30                           | 75                      | 1                                 | 51                   | 313  | 117.6   | 62.5                              |
|                  | 22933                | Starke      | 6  | 0                                    | 0                            | 3                       | 0                                 | 3                    | 12   | 52.3  | 27.8                              |
|                  | 33773                | Steuben     | 14   | 1                                    | 0                            | 2                       | 1                                 | 1                    | 19   | 56.3  | 29.9                              |
|                  | 21763                | Sullivan    | 4  | 2                                    | 0                            | 1                       | 1                                 | 2                    | 10   | 45.9  | 24.4                              |
|                  | 9718                 | Switzerland | 0  | 0                                    | 0                            | 0                       | 0                                 | 1                    | 1  | 10.3  | 5.5                               |
| 1                | 153875               | Tippecanoe  | 46   | 35                                   | 22                           | 16                      | 0                                 | 37                   | 156  | 101.4   | 53.9                              |
| 2                | 16385                | Tipton      | 7  | 0                                    | 0                            | 2                       | 0                                 | 0                    | 9  | 54.9  | 29.2                              |
|                  | 7208                 | Union       | 4  | 1                                    | 0                            | 0                       | 0                                 | 0                    | 5  | 69.4  | 36.9                              |
| 1                | 173187               | Vanderburgh | 103  | 37                                   | 21                           | 18                      | 2                                 | 41                   | 222  | 128.2   | 68.1                              |
| 2                | 16562                | Vermillion  | 1  | 1                                    | 0                            | 1                       | 0                                 | 5                    | 8  | 48.3  | 25.7                              |
| 1                | 102592               | Vigo        | 53   | 33                                   | 10                           | 20                      | 1                                 | 18                   | 135  | 131.6   | 69.9                              |
|                  | 33843                | Wabash      | 13   | 1                                    | 0                            | 2                       | 0                                 | 3                    | 19   | 56.1  | 29.8                              |
|                  | 8785                 | Warren      | 1  | 0                                    | 0                            | 2                       | 0                                 | 1                    | 4  | 45.5  | 24.2                              |
| 2                | 56362                | Warrick     | 30   | 20                                   | 9                            | 7                       | 0                                 | 12                   | 78   | 138.4   | 73.5                              |
|                  | 27885                | Washington  | 8  | 4                                    | 1                            | 0                       | 0                                 | 1                    | 14   | 50.2  | 26.7                              |
|                  | 69192                | Wayne       | 19   | 20                                   | 4                            | 14                      | 0                                 | 13                   | 70   | 101.2   | 53.8                              |
| 2                | 28085                | Wells       | 14   | 3                                    | 5                            | 4                       | 2                                 | 5                    | 33   | 117.5   | 62.4                              |
|                  | 24463                | White       | 10   | 0                                    | 0                            | 0                       | 0                                 | 1                    | 11   | 45.0  | 23.9                              |
| 2                | 32323                | Whitley     | 9  | 1                                    | 0                            | 5                       | 0                                 | 2                    | 17   | 52.6  | 27.9                              |

† MSA counties are coded 1 = center county in the MSA; 2 = collar county in the MSA. Those left blank are non-MSA counties

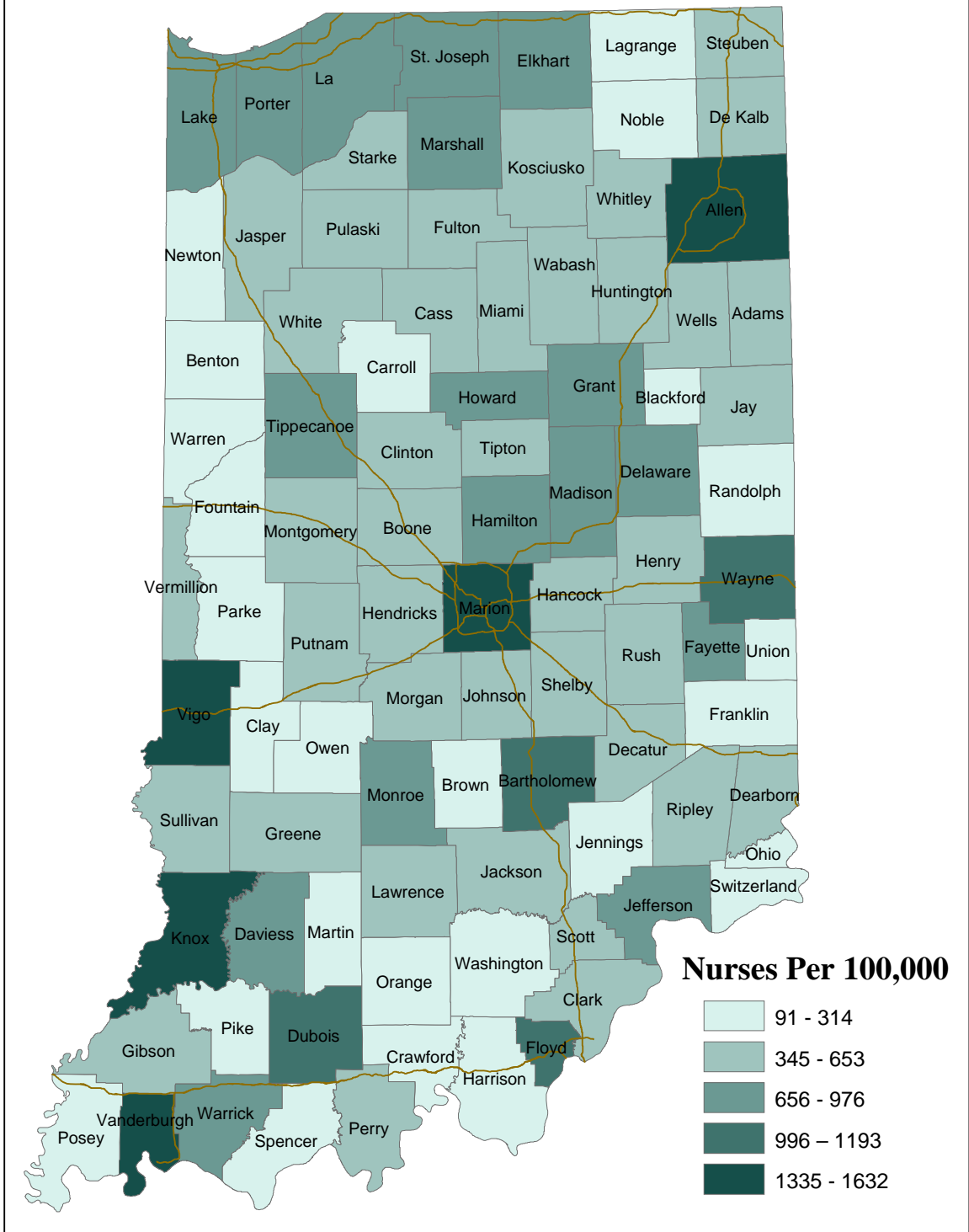
‡ The Area Resource File does not differentiate between primary care and non-primary care Doctors of Osteopathy

\* The director of the IU School of Nursing Nurse Practitioner program indicated that nearly all Nurse Practitioners in rural areas are primary care providers and about 60% of those in MSAs are primary care providers

**Map 1: All Types of Primary Care Providers 2005  
Per 100,000 Population by County**



**Map 2: Registered Nurses Practicing in Indiana 2005  
Per 100,000 Population by County**



## II. Public Health and Economic Burden

There is a broad consensus that access to timely, primary and preventive health care results in lower health care costs and better health outcomes than uncoordinated, delayed care.<sup>12, 21, 22</sup> The shortage of health professionals is a major barrier to accessing appropriate patient care, particularly in areas designated as Health Professions Shortage Areas and Medically Underserved Areas. When communities don't have health professionals who are willing and able to provide health care within a reasonable travel distance of the community, residents tend to delay seeking the most cost-effective care available. The shortage of certain types of health care providers in specific geographic areas creates a barrier to accessing appropriate care and, consequently, individuals seek primary care in emergency departments, where care is expensive and inconsistent.

A study of vulnerable populations documented the link between shortages of primary care providers and increased preventable hospitalizations. *“Medicare beneficiaries in fair or poor health are more likely to experience a potentially preventable hospitalization if they live in a county designated as a primary care shortage area. Provision of Medicare coverage alone may not be enough to prevent poor ambulatory health care outcomes such as preventable hospitalizations.”*<sup>21</sup>

Individuals who do not receive preventive care services, who do not receive care early in their disease process, or who seek primary care in the emergency departments suffer from a lower quality of life. Further, citizens in poor health are not as productive as they could be otherwise and this loss of productivity restricts their ability to support local and state businesses.

With health professional shortages, health care facilities are not able to fully staff their departments, putting an excess burden on existing staff and significantly increasing the cost of care they deliver.

According to a report for the Indiana Health Industry Forum, *“...the health industries will be essential parts of the state's economic success in future decades. If so, then the health industries must be able to recruit the workforce they need to sustain their growth and development. Yet, many employers report that they either currently have difficulty locating workers to fill key positions, or expect to have the problem in the near future.”*<sup>23</sup>

The increase in cost of care is reflected in the cost of health insurance premiums paid by businesses and employees, as well as higher co-payments and deductible amounts paid by individuals. The increased cost of health care also increases the cost of products produced and services rendered by Indiana residents, which decreases our competitive business standing with other states.

### **III. Proposed Solutions**

Develop the necessary workforce to support the medical care concept throughout Indiana by:

- Expanding the training capacity for critical-shortage health care professions, including primary care physicians (family practitioners, general internists, pediatricians), non-physician primary care providers (nurse practitioners and physician assistants), and nurses. Strategies include:
  - Increasing class sizes for health care worker and professional training programs
  - Targeting students based on prediction for rural and urban inner-city primary care practice
  - Increasing higher education investment in remote teaching technologies
  - Increasing “teaching faculty” numbers, including part-time and adjunct teaching faculty
  - Increasing “teaching faculty” pay for critical health care training programs
- Establishing rural and community health training programs specifically designed to train primary care providers, including primary care physicians, nurse practitioners, physician assistants, and nurses.
- Require clinical training experiences in rural and urban inner-city primary care, medically underserved settings for health care students.
- Offering targeted, best practice financial aid incentives for health care students and professionals who commit to serving identified areas where there is a critical shortage of health care services.

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