**Medical School Capacity Study**
**October 23, 2013**

**Overview**

Anticipating physician workforce needs 20 years into the future is a challenge made both more necessary and more difficult by the changing environment of health care delivery. Meaningful projections must consider a range of complex factors – and no two studies utilize the same approach or variables. In a working paper released in June 2013, the Organization for Economic Co-operation and Development analyzed 26 health workforce projection models produced by 18 member countries. The OECD found that each of the studies considered a different set of variables in producing its forecasts. The American Association of Medical Colleges recently published *Physician Workforce Projections in an Era of Health Care Reform,* a paper that defines the following factors as having the greatest influence on physician supply and demand:

***Supply =***
**[Current** (physician hours) + **New** (graduate medical education enrollment, international medical graduates) – **Exits** (age, economy)] x **Efficiency** (teams, structure, tools)

***Demand =***
**Population** (size, demographics) x **Health** (prevalence, incidence) x **Utilization** (access, structure, supply)

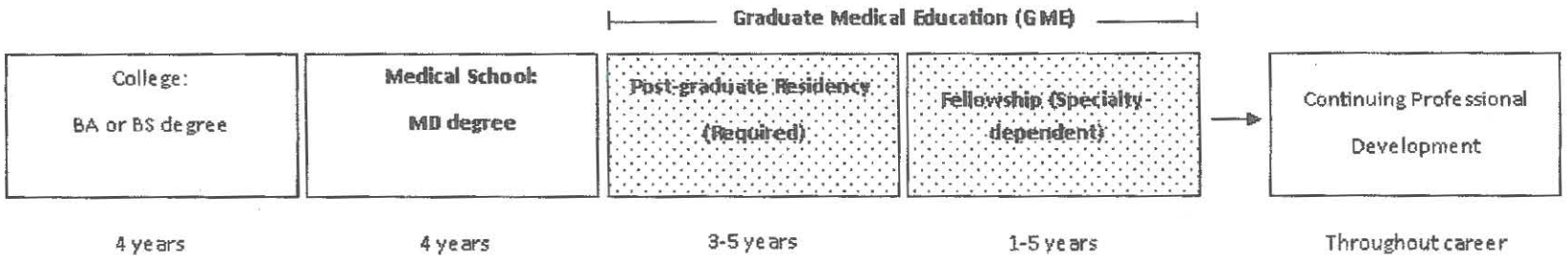
To our knowledge, projections available to date for Minnesota take some but not all of these variables into consideration.

We provide this background to illustrate the difficulty of identifying one set of data that best illustrates the future need for physicians in Minnesota. Health workforce studies are complex, costly and reliant on assumptions. Although we consulted with the Minnesota Department of Health and the Metro Minnesota Council on Graduate Education (MMCGME) and searched the literature, we were unable to locate a single study that provided all the information requested by the legislature. In order to meet the legislature's request, we have combined data from multiple reliable sources and made some assumptions of our own. We have taken care to clearly identify our sources, how our projections were calculated and the predictions on which our projections are based.

Our resulting projections rely on multiple assumptions (spelled out in this document). The task of drafting this response to the legislature underscores the need for a comprehensive, Minnesota-centric analysis of health care workforce needs.

**The Residency Bottleneck**

We appreciate the legislature's inquiry into future physician demand. We noticed, however, that most of the questions posed by the legislature focus on *medical school* graduation rates without taking into consideration the number of learners we are able to accommodate in *residency training*. Residency, or Graduate Medical Education (GME), is the component of physician training that follows medical school. Residency training is required for licensure and lasts from three to ten years, depending on the medical specialty. The sequence of training is as follows:




Resident training positions are paid principally by federal Medicare and state Medical Education and Research Cost (MERC) funds. GME looms as the bottleneck that will have the greatest impact on our ability to meet the state's future workforce requirements.

The equation for supply on page one of this document points out that the number of residency slots is a key factor in determining the number of physicians available to meet future demand. The state could significantly increase its medical student enrollment, but without a corresponding increase in GME positions, we would not be able to provide a higher number of new clinicians. The number of GME training slots is limited by the federal 1997 Balanced Budget Act and fluctuations in federal and state financial support. In fact, Congress is currently considering significant additional reductions in funding for GME. Stable funding is essential to the success of residency training. The uncertain funding climate has long term repercussions for Minnesota's health care workforce: a high percentage of those who complete training here remain in Minnesota to practice. 67% of Minnesota's current active physicians completed medical school or GME training within the state; 34.7% completed medical school here; 64.6% completed GME training in Minnesota; 31.9% completed both medical school and GME training in Minnesota. According to studies nationally, most physicians practice within a 100 miles of where they did they residency training. Without a simultaneous increase in in-state residency positions, an increase in the number of students moving through our medical school would have little impact on the number of physicians available to practice in Minnesota. An increase in residency positions will require a change in GME funding formulas at the federal and state levels, however.

Historical Data on Applications, Admissions and Matriculation

1. **Provide the number of applicants seeking admission to the school for the academic term commencing in the fall of 2013 and the number admitted.**

| Program | Number of Applicants | Number Admitted (Began Training) |
|---|---|---|
| Medical School, Twin Cities Campus | 3830 | 163 |
| Medical School, Duluth Campus | 1674 | 60 |
| MD/PhD program, Twin Cities Campus | 213 | 07 |
| TOTALS, all programs | 5,717 | 230 |

**2. Provide the number of applicants admitted to the school for each of the fall academic terms from 2000 through 2012.**

Medical school enrollment has held steady for the 13 years included in the table below.

**Annual Total Applicants/Admits, 2000 through 2012**
Includes Twin Cities and Duluth Medical Schools and the MD/PhD program

| | Number of Applicants | | | | Number Admitted (Began Training) | | | |
|---|---|---|---|---|---|---|---|---|
| | MD/ Twin Cities | MD/ Duluth | MD/PhD | Total | MD/ Twin Cities | MD/ Duluth | MD/PhD | Total |
| **2012** | 3627 | 1487 | 179 | **5293** | 163 | 60 | 07 | **230** |
| **2011** | 3522 | 1279 | 170 | **4971** | 164 | 60 | 06 | **230** |
| **2010** | 3338 | 1281 | 177 | **4796** | 164 | 60 | 05 | **229** |
| **2009** | 3224 | 1352 | 153 | **4729** | 163 | 60 | 06 | **229** |
| **2008** | 3162 | 1413 | 165 | **4740** | 163 | 60 | 07 | **230** |
| **2007** | 3028 | 1330 | 165 | **4523** | 174 | 58 | 09 | **241** |
| **2006** | 2493 | 1281 | 127 | **3900** | 156 | 56 | 09 | **221** |
| **2005** | 2260 | 954 | 146 | **3360** | 160 | 66 | 05 | **231** |
| **2004** | 2130 | 625 | 141 | **2896** | 159 | 53 | 06 | **218** |
| **2003** | 1987 | 458 | 163 | **2608** | 157 | 53 | 08 | **218** |
| **2002** | 1645 | 647 | 110 | **2402** | 160 | 55 | 06 | **221** |
| **2001** | 1654 | 744 | 70 | **2468** | 156 | 54 | 09 | **219** |
| **2000** | 1696 | 730 | 44 | **2470** | 157 | 53 | 08 | **218** |

**Projections for the Future of Medical Education in Minnesota**

3. **Provide the number of *medical* school graduates projected for each of the next ten years.**
   At this time, the University of Minnesota has no plans to increase the number of medical students on either the Twin Cities or the Duluth campus, given the bottleneck in the number of available residency training slots. We anticipate that the number of medical school graduates for each of the next ten years will remain at today's levels of 230 annually.

4. **Provide the number of graduates projected to remain and practice in Minnesota after graduation for each of the next ten years.**
   GME programs affiliated with the Metro Minnesota Council on Graduate Medical Education (which include the University of Minnesota and several smaller community based programs) graduate approximately **200** residents and fellows each year who enter directly into practice. Approximately 65% or **130** remain in Minnesota to start their careers. (These figures represent all Minnesota residency graduates except those who have gone through training programs affiliated with Mayo.) This number is not expected to increase at any time in the next ten years because the number of graduate medical education positions (residencies) is capped at 1996 levels by the Balanced Budget Act of 1997. No increase in positions is anticipated, and, in fact, threats to MERC funding may actually trigger a decrease in total positions available. We anticipate that the number of residents/fellows completing their graduate training in each of the next ten years will remain at today's levels.

5. **Describe the plans of the university to increase the capacity of the school.** The University of Minnesota has no plans to increase capacity at either the medical school or graduate training level at this time.

6. **Provide the most recent and accepted analysis concerning the need for physicians in Minnesota in the future, including time frames of the next five, ten, 15 and 20 years. The need must be stated in the aggregate and in specialty practice areas.**

We researched a number of sources but were unable to locate data that addressed all of the components requested. Our solution was to draw estimates based on data from two different primary sources:

- Our baseline data came from a 2012 study produced by the Metro Minnesota Council on Graduate Medical Education that analyzed licensure data of physicians practicing in Minnesota
- Our estimates for future supply and demand were derived from the 2008 report from the Health Resources and Services Administration (HRSA), *"The Physician Workforce: Projections and Research into Current Issues Affecting Supply and Demand"* (http://bhpr.hrsa.gov/healthworkforce/reports/physwfissues.pdf). In this report, HRSA projects changes in supply/demand by specialty in five year increments through 2020. We identified the percentage increases used by specialty for each five year time period and applied them to our baseline data.

The following two tables project physician *supply* and *demand* in Minnesota through 2020. We could find no reliable projections for growth in demand by specialty beyond 2020, so we have not provided projections through 2033.

| | Active, Licensed MN Physicians by Specialty per MMCGME study | Projected Physician SUPPLY by Specialty per HRSA increase estimates at 2015 and 2020 | | | |
|---|---|---|---|---|---|
| | 2012 baseline | 2015 | % increase, 2012-2015 | 2020 | % increase, 2015-2020 |
| **Primary Care** | **5185** | **5478** | **5.64%** | **5704** | **4.13%** |
| General Family Medicine | 2426 | 2570 | | 2692 | = |
| General Internal Med | 1374 | 1451 | | 1505 | |
| Pediatrics | 994 | 1048 | | 1088 | |
| Ob/GYN | 391 | 408 | | 420 | |
| **Non-Primary Care** | **6104** | **6293** | **3.09 %** | **6400** | **1.70%** |
| *Medical Specialties* | | | | | |
| Cardiology | 326 | 335 | | 336 | |
| Other Internal Medicine | 1019 | 1056 | | 1082 | |
| *Surgical Specialties* | | | | | |
| General Surgery | 310 | 307 | | 304 | |
| Ophthalmology | 275 | 275 | | 272 | |
| Orthopedic Surgery | 388 | 390 | | 388 | |
| Otolaryngology | 159 | 161 | | 159 | |
| Urology | 126 | 123 | | 119 | |
| Other Surgery | 293 | 293 | | 289 | |
| *Specialties* | | | | | |
| Anesthesiology | 480 | 511 | | 529 | |
| Emergency Medicine | 438 | 469 | | 494 | |
| Pathology | 263 | 264 | | 266 | |
| Psychiatry | 750 | 774 | | 788 | |
| Radiology | 758 | 782 | | 797 | |
| Other | 519 | 553 | | 577 | |
| Subtotal, board certified physicians | **11,289** | **11,771** | | **12,104** | |
| No board certification | **755** | **787** | **4.27%** | **809** | **2.83%** |
| | **12,044** | **12,558** | * | **12,913** | ** |

- 2012 baseline data by specialty from MMCGME study on Minnesota licensure data.
- Projected increase rates by specialty from 2008 HRSA report: The Physician Workforce: Projections and Research into Current issues Affecting Supply and Demand (http://bhpr.hrsa.gov/healthworkforce/reports/physwfissues.pdf); Exhibit 51: Baseline FTE Supply Projections of Active Physicians
- *Average increase, all board certified disciplines, 2012 to 2015, is 4.27%. This percentage increase was used to estimate the increase in the number of physicians without board certification, 2012 to 2015.
- **Average increase, all board certified disciplines, 2015 to 2020, is 2.83%. This percentage increase was used to estimate the increase in the number of physicians without board certification, 2015 to 2020

| | Active, Licensed MN Physicians by Specialty per MMCGME study | Projected Physician DEMAND by Specialty per HRSA increase estimates at 2015 and 2020 | | | |
|---|---|---|---|---|---|
| | 2012 baseline | 2015 | % increase, 2012-2015 | 2020 | % increase, 2015-2020 |
| **Primary Care** | **5185** | **5485** | **5.79%** | **5819** | **6.08%** |
| General Family Medicine | 2426 | 2573 | | 2734 | |
| General Internal Med | 1374 | 1480 | | 1598 | |
| Pediatrics | 994 | 1031 | | 1076 | |
| Ob/GYN | 391 | 401 | | 412 | |
| **Non-Primary Care** | **6104** | **6559** | **7.46%** | **7062** | **7.66%** |
| *Medical Specialties* | | | | | |
| Cardiology | 326 | 360 | | 399 | |
| Other Internal Medicine | 1019 | 1107 | | 1201 | |
| *Surgical Specialties* | | | | | |
| General Surgery | 310 | 335 | | 361 | |
| Ophthalmology | 275 | 300 | | 327 | |
| Orthopedic Surgery | 388 | 416 | | 449 | |
| Otolaryngology | 159 | 168 | | 179 | |
| Urology | 126 | 139 | | 151 | |
| Other Surgery | 293 | 316 | | 343 | |
| *Specialties* | | | | | |
| Anesthesiology | 480 | 519 | | 563 | |
| Emergency Medicine | 438 | 459 | | 482 | |
| Pathology | 263 | 282 | | 300 | |
| Psychiatry | 750 | 788 | | 827 | |
| Radiology | 758 | 816 | | 885 | |
| Other | 519 | 555 | | 595 | |
| Subtotal, board certified physicians | **11,289** | **12,044** | | **12,881** | |
| No board certification | **755** | **806** | **6.69%** | **862** | **6.95%** |
| | **12,044** | **12,850** | * | **13,743** | ** |

- 2012 baseline data by specialty from MMCGME study on Minnesota licensure data.
- Projected increase rates by specialty from 2008 HRSA report: *The Physician Workforce: Projections and Research into Current issues Affecting Supply and Demand* (http://bhpr.hrsa.gov/healthworkforce/reports/physwfissues.pdf); Exhibit 52: Baseline Physician Requirements Projections
- *Average increase, all board certified disciplines, 2012 to 2015, is 6.69%. This percentage increase was used to estimate the increase in the number of physicians without board certification, 2012 to 2015.
- **Average increase, all board certified disciplines, 2015 to 2020, is 6.95%. This percentage increase was used to estimate the increase in the number of physicians without board certification, 2015 to 2020.

**Observations from These Supply and Demand Projections**

- The licensure data we used as our baseline corresponds to an AAMC figure for total active patient care physicians in Minnesota.
- The total physician supply predicted for 2020 by our tables corresponds to supply figures for Minnesota projected in a Georgetown study based on Bureau of Labor Statistics data: http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/Healthcare.States.082212.pdf
- Overall physician demand is projected to be 13,743 in 2020, while supply is projected to be 12,913. The gaps are particularly acute in non-primary care specialties.
- Our tables project that two primary care disciplines will not have a shortage of physicians in Minnesota by 2020: pediatrics and Ob/GYN. The disciplines of family medicine and general internal medicine *are* projected to have a shortage of 138 physicians in 2020, but this estimate is significantly less than the shortage of 1,000-3,000 primary care doctors projected in a separate study in Minnesota Medicine (http://minnesotamedicine.com/PastIssues/February2013/PriimaryCareisattheHeartofHealthReform.aspx). The Minnesota Medicine analysis included an Affordable Care Act (ACA) demand factor, which may be missing from our HRSA projections. Yet another study, released in September, 2013 by the Robert Graham Center, estimates that Minnesota will need 608 additional primary care physicians by 2020. This figure is in line with the growth in supply and demand projected by our tables. The same study goes on to project that by 2030, Minnesota will need 1,187 primary care physicians over current levels (Petterson, S.M., Cai, A., Moore, M., Bazemore, A. State-level Projections of Primary Care Workforce, 2010-2030. September 2013, Robert Graham Center, Washington, D.C.)
- In non-primary care, all disciplines are projected to have a shortage of physicians in Minnesota by 2020.

**Assumptions Incorporated into These Projections:**

- The HRSA report projects a percentage increase for each specialty for the nation as a whole, not for Minnesota specifically. Minnesota's increase rates may differ from the national rates.
- The HRSA report projected a percentage increase for each specialty for the period 2010 to 2015. We applied these same percentage increases to predict increases by specialty from 2012 to 2015.

**Weaknesses of Our Study:**

- The HRSA study was published in 2008 but used 2000 data as its baseline. The assumptions used in drafting these reports may differ from the actual outcomes that have been realized in the interim. More recent projections by specialty would have been preferred, as they would have taken into account influences that were not foreseeable in 2000. For example, these projections were made prior to authorization of the Affordable Care Act. How would more up to date projections take the ACA into account?
- Workforce reports use many different definitions of "active physician;" it is not always possible to compare two reports and be confident that they are using the same parameters. Variables that may or may not be factored into a report's definition of physician include:
  - Does the definition of physician include residents? Doctors of Osteopathic Medicine?
  - Does the definition reflect FTEs or count all physicians as one unit, even if they are working less than full -time?
  - Does the definition include all active physicians? Licensed physicians? Physicians practicing within Minnesota? Physicians active in direct patient care?
- The HRSA increase projections take nationwide physician age and retirement into account. In 2012, 13.82% of active physicians practicing in Minnesota were age 66 or older. Over the next ten years, an average of 350 Minnesota physicians per year will reach age 65. It is unclear how Minnesota's age/retirement rates compare to the national data reflected in the HRSA projections.
- The impact of these workforce projections does not take into account care by non-physician providers such as physician assistants, doctors of nursing practice/nurse practitioners, and other team-based models of care.