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A Commentary on Considering Recent Trends in Health Care Labor Markets in Educational Program Planning in Allied Health

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Abstract

Recent trends in wages and employment should be considered more often to help inform recruitment and expansion planning for educational programs related to training the future health care workforce. We present a relatively straightforward method for summarizing and assessing a broad set of relative health labor market trends from 2010 to 2014 based on the number employed and wage rates across all health care related occupational categories available from the Occupational Employment Statistics (OES) data. To focus more specifically on trends within the health care sector we use the relative wages and employment of the occupations compared to Medical Doctors.

Of 19 broad occupational categories from OES, Pharmacists, Physician Assistants, and Occupational and Physical Therapists have been experiencing a growth in demand relative to Medical Doctors as evidenced by a growth in relative wages and relative employment. There is also clear evidence of a reduction in the relative supply of allied health workers as a group relative to Medical Doctors. Specifically, across all Allied healthcare workers there was an increase in relative wages (2.28%) and a decline in relative employment (-3.64%). Occupations with strong increases in wages and number employed are likely to be good areas for programs to expand both in terms of the future economic welfare of their graduates and to help meet market demand.
Background

The provision of health care services in the US remains labor intensive and increasingly incorporates a multidisciplinary approach. Recent general health workforce evaluations maintain that an insufficient supply of health care providers continues to be a major concern in US, though it was somewhat abated by the recession in 2007. Further, shortages of some health care providers may worsen as the economy continues to recover, the population continues to age, and as the Affordable Care Act (ACA) increases the number of insurance beneficiaries.

Consequently, recruitment and training of future health professionals remains vital. Further, while there are several factors that should go into planning for training health professionals, recent trends in wages and employment are important considerations and generally underutilized.

This is especially true for allied health. In general, the health workforce literature focuses on primary care, where recent studies demonstrate an increase in demand for primary health care professions including physicians, nurses, and physician assistants in the US. According to several available projections, at its current pace the US postsecondary education system training these groups of health professionals will not be able to meet expected increases in demand over the next few years. However, the majority of allied health care occupations tracked by United States Bureau of Labor Statistics (BLS), have not received much attention and their status in terms of demand versus supply is largely unreported. Meanwhile, these occupations comprise about 60% of US healthcare labor force. We present an easy to adopt strategy for examining wage and employment trends. In examining the data we also provide a novel summary of trends in wages and numbers employed across health care related occupations relative to Medical Doctors that have not been investigated in previous studies. For the purposes of this general commentary we include the broadest possible set of occupations and select the
Main Text

Using relative wages serves as a crude control for general trends in inflation and other national level factors impacting broad sets of wages that likely would not be related to selecting to train in one profession versus another. Training programs related to a smaller set of occupations could focus in more detail on a smaller set of occupations from the same data.

Framework and Methods for Considering Market Trends

Based on a standard microeconomic model of relative wage determination in a labor market, professionals experiencing growth in relative employment and relative wages over 5 years, here relative to Medical Doctors, can be considered as ‘In Demand Jobs’, meaning relative demand growth has been outpacing any changes in the relative supply (see Figure 1). Conversely, ‘Jobs in Decreasing Demand’ can be identified based on declines in both the relative number employed and in relative wages over time (Figure 1). Though not illustrated specifically in Figure 1, in the same basic supply and demand model, relative wage growth combined with reductions in relative employment are evidence of a (net of demand) decrease in supply and decreasing relative wages along with an increase in relative employment indicates a relatively rapidly expanding supply.

Given this general framework, recent national trends in numbers employed and in wage rates for all available health professions relative to those of Medical Doctors are presented using the US Occupational Employment Statistics (OES) data obtained online from the BLS Databases. These wage and employment data are collected by the Quarterly Census of Employment and Wages and include 800 standard occupations and are freely available. Here all job categories whose occupational codes (OCC code) beginning with ’29: Healthcare
Practitioners and Technical Occupations’ or ’31: Healthcare Support Occupations’ were included, and other health care related occupations not covered by those OCC groups including psychologists, medical secretaries, counselors and community health workers in the data were also selected based on more detailed coding. The total number employed and annual average wages by detailed job category were extracted and 5 year percentage changes (from 2010 throughout 2014) were calculated. New occupational categories from 2011 through 2014 were merged into the corresponding broader categories that were used in 2010. In these cases, changes in the number employed and weighted average wages were estimated for the merged class. Wages were expressed in 2014 US dollars and were inflated from prior years using the Consumer Price Index for all urban consumers (CPI-U).

We also provide some trends in groups of occupations across broad sets of services based on OCC codes, OCC titles and occupational profiles. Again, as the primary reference point here, detailed occupations requiring a Doctor of Medicine (See Table 1) were merged into the medical doctors group (MDs). Occupational categories likely involved in independent clinical decision-making, and/or with full or partial prescription authorization, or that deliver healthcare directly to patients under the supervision of MDs were grouped in the category of primary practitioners (See Table 1). All other healthcare occupations that had not been classified as MDs or primary practitioners were broadly defined as allied healthcare occupations and grouped into subclasses again on the basis of the typical services each occupational group delivers (Table 1). Occupational titles associated with specialization in providing technical support in a specific diagnostic area, specifically any occupational category with an OCC code beginning with 29-2, but who are not typically authorized to make independent clinical decision were put in the technician or technologist group. In addition, therapy assistants or aides who are typically not
specialized in a diagnostic technology were grouped into the supporting occupations. Finally, therapists, counselors, and social workers were respectively grouped based on detailed OCC titles. For the merged and broader categories, the number employed was the sum of the workforce of every detailed category, and annual wages represented the weighted average annual wage where the weights were the number employed that year in each of the detailed occupations.

Trends in real wages and the numbers employed for each specific and grouped set of occupation were calculated using Equation 1 below. In order to project the relative supply and demand of allied healthcare professionals, changes in relative wages and relative employment between 2010 and 2014 were determined for the specific and grouped sets of occupations as defined in Equation 2 where relative statistics in each occupational category was determined by the statistics in each year divided by the number for the occupational title with Medical Doctors.

\[
\% \text{Change over 5 years} = \frac{\text{Statistic in 2014} - \text{Statistic in 2010}}{\text{Statistic in 2010}} \times 100 \% \tag{1}
\]

\[
\% \text{Change in Relative wage or employment} = \left( \frac{\text{Relative Statistic in 2014} - \text{Relative Statistic in 2010}}{\text{Relative Statistic in 2010}} \right) \times 100 \% \tag{2}
\]

Based on the supply and demand model discussed above and in Figure 1, occupational groups were plotted into four quadrants with the Y axis plotting positive or negative trends in relative wages between 2010 and 2014 and the X axis plotting positive or negative trends in relative employment. Each of the four quadrants is implicitly related to recent trends in the relative supply and demand that each occupational category has experienced as follows: (1) the
northeast quadrant is evidence that an increase in the relative demand outpaced any increase in the relative supply; (2) the northwest quadrant indicates the relative supply stagnated behind any changes in relative demand; (3) the southwest quadrant is associated with a decrease in relative demand outpacing any drop in relative supply; (4) the southeast quadrant indicated the increase in the relative supply outpacing any increases in the relative demand.

Recent Market Trends

As noted in Table 1, a total of 93 occupations were categorized into 19 groups, and wage rates and labor quantities of each merged occupational category were listed. A broader set of 6 groupings was also used to show general trends in employment and in wages between 2010 and 2014. The total number of employed health care workers increased over the study period in each of the five broadest categories although the growth overall (4.01%) was smaller than the overall average across all US occupational categories (6.32%). In addition, a decrease was seen in the average wage rates of each of the broad health care occupational groups though overall the decline in wages was smaller in health occupations (0.78%) than in all occupations (2.04%). Table 1 shows changes across time in absolute terms as well as changes in relative wages and employment. Changes across time in real wages and the number employed of allied healthcare providers were -1.08% and 3.04%, which were notably smaller than the changes for MDs (-3.29% and 6.93%). The overall changes in the wages and number employed of primary care providers other than MDs (-1.01% and 5.59%) were also less than those of MDs.

Using MDs as a reference point, allied healthcare providers experienced a 2.29% increase in relative wages and a 3.64% decrease in relative employment. The relative changes of wages and number employed for the primary care provider group compared to MDs’ were 2.36% and -
1.26%, respectively (see Table 1). Change in relative wages and employment across broad sets of occupations are also plotted in Figure 2.

Figure 3 plots trends in the 19 detailed occupational categories relative to Medical Doctors. Of primary healthcare providers, pharmacists, registered nurses and physician assistants, were located in the northeast quadrant. The number of employed licensed practical nurses decreased but they did not experience notable change in relative wages. The relative number of employed dentists increased though their relative annual wage dropped over the study period suggesting an increase in relative supply.

Meanwhile, many of the specific allied healthcare occupations tended to show signs of demand exceeding supply relative to Medical Doctors. The majority of the allied healthcare occupations (9 out of 12 categories) saw an increase in their relative annual wage. Of them, all three therapist groups (occupational therapists, physical therapists, and other therapists), as well as pharmacy technicians, and occupational health specialists also experienced a relative increase in the number employed, which is evidence of an increase in the relative demand that outpaced any changes in the relative supply. Social workers, emergency medical technicians or paramedics, assistants not classified elsewhere, and technicians not classified elsewhere experienced an increase in relative wage and a decrease in relative employment, which is consistent with a backward shift in supply relative to medical doctors. In addition, declines in both the relative annual wages and the numbers employed of nursing aides and counselors were observed, which is consistent with a reduction in relative demand.
Discussion

We believe the framework presented here provides a useful snapshot for setting targets in workforce training programs. In general, over the past five years, a period of economic recovery, there was a notable increase in the number of employed workers in health care related occupations. At the same time there were general declines in the level of wages. Several interesting trends were observed in the relative wages and number employed of various health occupations relative to Medical Doctors. Physician Assistants demonstrated a particularly large positive shift in relative demand between 2010 and 2014 as evidenced by large growth in both wages and employment relative to Medical Doctors.

A shortage of primary health care providers in the US and corresponding recommendations for expansion of training programs to supply more primary care providers have been described in general analyses conducted in 2009 and 2010.(12, 17) In considering the utilization of supporting health care occupations in the primary care setting, conversely, a recent workforce analysis projected that the national supply of primary care physicians can come close to meeting the national demand by 2020.(9) The results from our analysis, indicating a surge in the number of employed physicians coupled with slightly declining wages is tentatively aligned with the latter primary care workforce projections which provides some validation of our analysis.(9)

Relative shifts in the occupational groups can and should help inform strategy for training initiatives. For example, supply appears to be lagging relative to Medical Doctors in Social Workers and in Other Supporting Occupations which is tending to increase the wages of those groups. There seems to be a decrease in demand for counselors and nursing aides, and an increase in demand for several major allied health occupations including occupational and
physical therapists. Growth in relative demand for particular groups suggests areas where related training programs may want to look at expansion. In addition, where there has been a decrease in supply, there may need to be broader strategies to promote entry into those professions, and rising wages should help provide incentive to potential recruitment.

The demand for allied healthcare professions is being fueled in part by a desire to substitute more across occupations and as the disciplinary boundary of each profession becomes less distinct. Further, the ACA requires a varied workforce to be included in the scope of healthcare delivery in order to increase healthcare access to a larger population. With regard to these increasing demands, the extent of primary care service provided by non-physician healthcare workers is expected to increase from 23% in 2010 to 28% in 2020.

Increasing health care needs of the US population combined with an upsurge in the number of beneficiaries requires expansion in post-secondary medical education. However, our results along with previous studies suggest that the US needs to target expansion of training programs informed by anticipated changes in demand. Training to improve workforce supply should keep in mind the potential for substitution across occupational categories. In addition, educational programs for the non-clinical workforce and supporting occupations are going to be a crucial area for additional research related to health care training and health service delivery.

This framework has several limitations. First, not all licensed or trained workers are clinically active, which is not captured in BLS data. Therefore, there may be a sizable gap between the number of employed workers and the number of licensed health care providers, which is important to consider for planning related to specific postsecondary educational programs. However, trends in wages and employment rising over time do suggest that future returns to education in health care are likely to be high. That said, a second limitation is that
future trends may not persist. Aspects of labor markets that are particularly hard to predict include the impact of future policy towards reimbursement of services as well as the potential impact of technological advances in health services delivery. A third consideration is that our estimates are based on labor market outcomes that may not be aligned with the actual underlying “need” or optimal long run level of services for a particular population. Clearly training initiatives in health services should broadly consider what is best for the community they ultimately serve. Here though it is still worth knowing if wages are falling as that might necessitate greater efforts at recruitment. Fourth, different health professionals may compete against each other in the future more than they have in the past five years, which may expedite substitution across different occupations. Finally, some of the trends seen in wages may reflect compositional changes in the workforce such as in average experience levels. However, the time period covered is relatively brief which limits the potential for compositional effects.

We maintain that the framework presented here can be useful to planners to briefly and broadly assess market trends across a wide variety of occupations that make up the current health care workforce for which there is generally little published information. Overall, our findings from recent years illustrate suggestive trends in labor market outcomes for a variety of allied healthcare professionals relative to medical doctors in the US. Several healthcare providers, particularly, pharmacists, physician assistants and supporting healthcare workers have been experiencing a growth in demand outpacing current supply relative to physicians. These findings should provide a useful reference for strategic planning related to postsecondary educational programs. In particular, programs related to occupations where demand has clearly been outpacing supply should consider expansion.
References


References


Figure 1. Jobs in demand and not in demand states defined by shifting relative supply and relative demand

Note. Both the relative quantity of health care providers employed and their relative wages increase when the growth of demand exceeds the market supply growth (i.e., from \([Q_1, W_1]\) to \([Q_2, W_2]\)). A decrease in demand outpacing a decrease in supply is implied by a drop in both relative wages and employment (i.e., from \([Q_2, W_2]\) to \([Q_1, W_1]\))

Abbreviations: \(Q\), quantity of labor at equilibrium point; \(W\), wage rate at equilibrium point; \(S\), market health care provider supply curve; \(D\), market health care provider demand curve
Table 1 Five-year changes in wages and the number employed in the health care workforce

<table>
<thead>
<tr>
<th></th>
<th>The number employed</th>
<th>Annual Wage (US $)</th>
<th>Relative Change† (%)</th>
<th>Real Change (%)</th>
<th>Relative Change† (%)</th>
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<tr>
<td></td>
<td>2010</td>
<td>2014</td>
<td>Change (%)</td>
<td>2010</td>
<td>2014</td>
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<td>All Occupations</td>
<td>127,097,160</td>
<td>135,128,260</td>
<td>+6.32</td>
<td>N/A</td>
<td>44,410</td>
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<td>All Healthcare related Occupations</td>
<td>13,132,080</td>
<td>13,659,010</td>
<td>+4.01</td>
<td>N/A</td>
<td>54,109</td>
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<td>Primary Practitioners</td>
<td>4,704,070</td>
<td>4,974,940</td>
<td>+5.76</td>
<td>N/A</td>
<td>83,853</td>
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<td>Medical Doctors (MDs)</td>
<td>592,410</td>
<td>633,480</td>
<td>+6.93</td>
<td>0</td>
<td>185,709</td>
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<td>Primary Practitioners other than MDs (Broad)</td>
<td>4,111,660</td>
<td>4,434,140</td>
<td>+5.59</td>
<td>-1.26</td>
<td>69,177</td>
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<td>Dentists</td>
<td>104,290</td>
<td>115,390</td>
<td>+10.64</td>
<td>163,862</td>
<td>157,452</td>
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<td>Pharmacists</td>
<td>268,030</td>
<td>290,780</td>
<td>+8.49</td>
<td>109,380</td>
<td>109,122</td>
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<td>Registered Nurses (RNs)</td>
<td>2,655,020</td>
<td>2,851,060</td>
<td>+7.38</td>
<td>67,720</td>
<td>66,495</td>
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<td>Physician Assistants (PAs)</td>
<td>81,420</td>
<td>91,560</td>
<td>+12.59</td>
<td>87,140</td>
<td>89,604</td>
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<td>Licensed Practical / Vocational Nurses (LPNs)</td>
<td>730,290</td>
<td>695,610</td>
<td>-4.75</td>
<td>41,360</td>
<td>39,994</td>
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<tr>
<td>Other Diagnosing and Treating Practitioners</td>
<td>272,610</td>
<td>296,950</td>
<td>+8.93</td>
<td>76,777</td>
<td>73,397</td>
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<td>Allied Health Workers (Other than PA and LPN)</td>
<td>8,428,010</td>
<td>8,684,070</td>
<td>+3.04</td>
<td>37,507</td>
<td>37,103</td>
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<td>Assistants, Supporting Occupations (Broad)</td>
<td>4,608,480</td>
<td>4,623,300</td>
<td>+0.32</td>
<td>29,598</td>
<td>29,312</td>
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<td>Dental Hygienists</td>
<td>177,520</td>
<td>196,520</td>
<td>+10.70</td>
<td>68,680</td>
<td>66,291</td>
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<td>Occupational Health and Safety Specialists</td>
<td>54,680</td>
<td>65,130</td>
<td>+19.11</td>
<td>65,610</td>
<td>64,909</td>
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<td>Nursing Aides, Orderlies, and Attendants</td>
<td>1,451,090</td>
<td>1,480,160</td>
<td>+2.00</td>
<td>25,140</td>
<td>24,192</td>
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<td>Assistants, Supporting Occupations, Other</td>
<td>2925190</td>
<td>2881490</td>
<td>-1.49</td>
<td>28,765</td>
<td>28,629</td>
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<td>Technicians. Technologists (Broad)</td>
<td>1,816,490</td>
<td>1,947,570</td>
<td>+7.22</td>
<td>41,427</td>
<td>40,388</td>
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<td>Emergency Medical Technicians and Paramedics</td>
<td>221,760</td>
<td>235,760</td>
<td>+6.31</td>
<td>33,300</td>
<td>32,340</td>
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<tr>
<td>Pharmacy Technicians</td>
<td>333,500</td>
<td>368,760</td>
<td>+10.57</td>
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<td>28,637</td>
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<td>Technicians, Other</td>
<td>1,261,230</td>
<td>1,343,050</td>
<td>+6.49</td>
<td>46,055</td>
<td>45,028</td>
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<td>Therapists (Broad)</td>
<td>616,010</td>
<td>669,530</td>
<td>13.23</td>
<td>66,080</td>
<td>64,744</td>
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<tr>
<td>Occupational Therapists</td>
<td>100,300</td>
<td>110,520</td>
<td>+10.19</td>
<td>73,380</td>
<td>73,687</td>
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<tr>
<td>Physical Therapists</td>
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<td>200,670</td>
<td>+11.31</td>
<td>77,990</td>
<td>77,317</td>
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<td>Therapist, Other</td>
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<td>386,340</td>
<td>+15.18</td>
<td>57,495</td>
<td>55,656</td>
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<tr>
<td>Counselors</td>
<td>607,810</td>
<td>613,750</td>
<td>+0.98</td>
<td>46,689</td>
<td>44,240</td>
</tr>
</tbody>
</table>

Change †: Percentage change from 2010 to 2014.
| Social Workers | 779,220 | 801,920 | +2.91 | -3.91 | 45,390 | 44,488 | -1.99 | +1.33 |

Note

1. Relative Change: Changes in wage and workforce relative to those of the MDs.
2. Medical Doctors includes anesthesiologists, general practitioners, internists, obstetricians, gynecologists, pediatricians, psychiatrists, surgeons, other physicians and surgeons.
3. Dentists includes general dentists, oral and maxillofacial surgeons, orthodontists, prosthodontists and dentists with other specialties.
4. Registered Nurses included general registered nurses, nurse anesthetists, nurse midwives and nurse practitioners.
5. Other Diagnosing and Treating Practitioners includes chiropractors, dietitians and nutritionists, optometrists, podiatrists, audiologists, psychologists and treating practitioners with other specialties.
6. Nursing Aides, Orderlies, and Attendants includes nursing assistants and orderlies.
7. Assistants, Supporting Occupations, Other includes dental assistants, home health aides, psychiatric aides, occupational therapy assistants, occupational therapy aides, physical therapist assistants, physical therapist aides, medical assistants, medical equipment preparers, medical transcriptionists, pharmacy aides, phlebotomists, medical secretaries, medical equipment repairers, athletic trainers and healthcare support workers with other specialties.
8. Technicians, Other includes laboratory technologists, laboratory technicians, cardiovascular technologists and technicians, diagnostic medical sonographers, nuclear medicine technologists, radiologic technologists, magnetic resonance imaging technologists, dietetic technicians, psychiatric technicians, respiratory therapy technicians, surgical technologists, ophthalmic medical technicians, medical records and health information technicians, dispensing opticians, orthotists and prosthetists, hearing aid specialists, occupational health and safety technicians, genetic counselors, health technologists and technicians with other specialties and all other healthcare practitioners and technical workers.
9. Therapist, Other includes radiation therapists, recreational therapists, respiratory therapists, speech-language pathologists, exercise physiologists, massage therapists and therapists with all other specialties.
10. Counselors includes substance abuse and behavioral disorder counselors, marriage and family therapists, mental health counselors, rehabilitation counselors and counselors with all other specialties.
11. Social Workers includes child/family/school social workers, healthcare social workers, mental health and substance abuse social workers, social workers with other specialties, health educators, community health workers, and community and social service specialists.
Figure 2. Five-year trends in percent change of aggregate wages and number employed for broad health care occupational groups relative to percent changes in wages and number employed for Medical Doctors.
Figure 3. Percent change in annual wages and number employed across five years in detailed occupational categories relative to percent changes in wages and number employed for Medical Doctors.