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The Role of Health Care in the Knoxville Area Economy: Trends and Economic Impacts

Introduction

This paper describes and quantifies the contribution of the health care sector to the Knoxville Metropolitan Statistical Area (KMSA) economy. The first section of the paper presents the current state of the KMSA health care sector in terms of employment and earnings and a comparative analysis of the rates of job growth in the health care sector and all other sectors of the KMSA. The second section of the paper presents an analysis of the economic impacts of the health care sector on total employment and earnings in the KMSA economy. The analysis presented in section two is accomplished through the use of economic impact multipliers developed for the region.

The KMSA, as defined by the U.S. Bureau of Labor Statistics (BLS), includes the counties of Anderson, Blount, Knox, Loudon and Union.

Health Care Sector Employment and Earnings

Employment trends by sector in the Knoxville MSA mirror those exhibited nationwide over the past decade. The main feature of this trend is a loss of jobs in the goods-producing industries, primarily manufacturing, and a gain in jobs in the services sectors, including health care. Over the 2000-12 period, employment in health care rose 34 percent, well above the 7- percent increase in employment in all other sectors combined (Figure 1).

Employment in the health care sector in the KMSA rose from less than 32,000 jobs in 2000 to nearly 43,000 in 2012 (Figure 2). As a result, the health care share of total employment was 12.8 percent in 2012, up from 10.5 percent in 2000. This rate of growth in the health care share of total employment was slightly less than the rate for all of Tennessee, which rose from 9.3 percent in 2000 to 12.8 percent in 2012.

Worker earnings for the health care sector averaged \$4,228 per month, compared to an average of \$3,864 for workers in all industries. Health care sector earnings were 14.0 percent of total earnings for all employees in the Knoxville MSA in 2012.

Figure 1. Trends in Employment, Knoxville MSA, 2000 - 2012

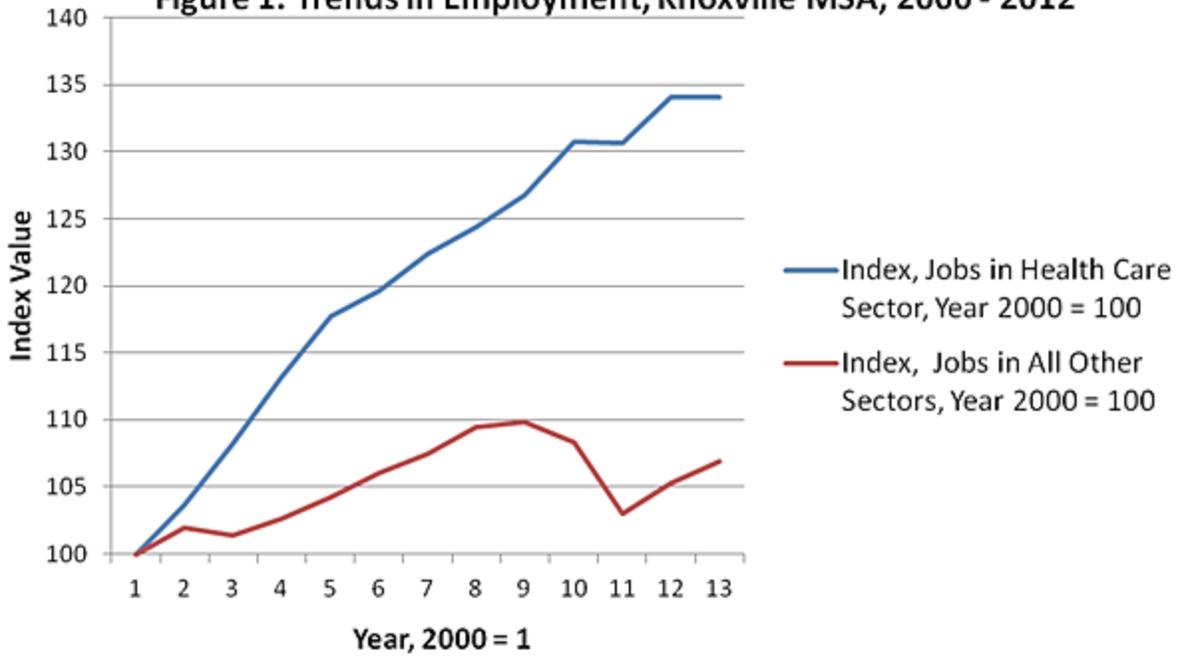
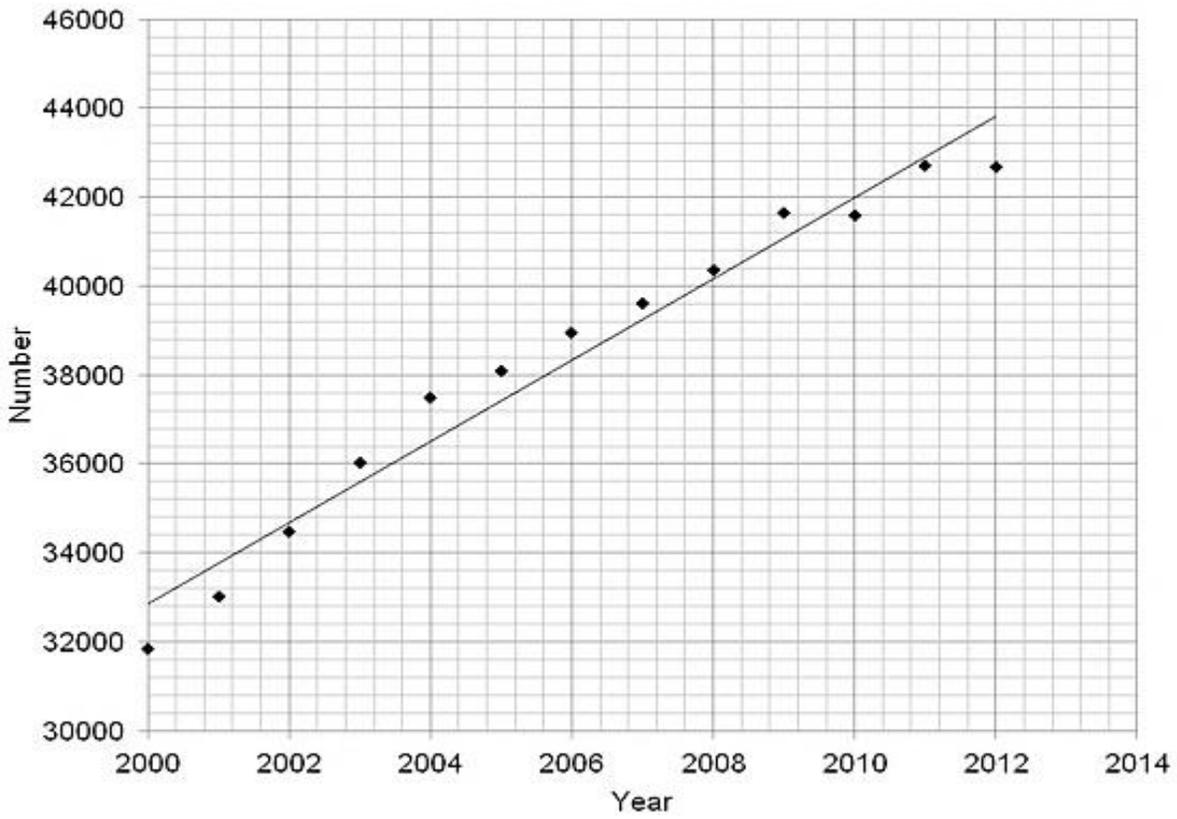


Figure 2. Trend in Health Care Employment, Knoxville MSA, 2000-2012



Health Care Subsectors

The health care sector is composed of three broad subsectors in the North American Industry Classification System (NAICS): (1) ambulatory health care services (primarily, offices of physicians and dentists, outpatient care centers, medical and diagnostic laboratories and home health care services), (2) hospitals and (3) nursing and residential care facilities (primarily, nursing care facilities, mental health and substance abuse facilities and community care facilities for the elderly). Employment and earnings for each subsector are presented in Table 1.

Table 1. Employment and Earnings, Knoxville MSA		
ITEM:	Employment ¹	Average monthly earnings ¹
All Occupations	333,235	\$ 3,864
Health Care Subsectors:		
Ambulatory health care services	17,979	\$ 5,481
Hospitals	18,358	\$ 3,655
Nursing and residential care facilities	6,356	\$ 2,340
Total Health Care	42,693	\$ 4,228
Health Care, percent of total	12.8 %	14.0 %
Source: Compiled from Quarterly <i>Workforce Indicators</i> , U.S. Census Bureau, Center for Economic Studies: http://lehd.ces.census.gov/applications/qwi_online/ . September 6, 2013.		
¹ Quarterly average for the four quarters ending Q2 2012.		

Health Care Economic Impacts

Economic Impact Multipliers

The Bureau of Economic Analysis (BEA) in the US Department of Commerce makes regional economic impact multipliers available through its Regional Input-Output Modeling System (RIMS II). These multipliers allow users to estimate the extent to which a one-time or a sustained change in economic activity will be supplied by industries within a region and, consequently, how this change in economy activity will affect total employment and earnings in the region.

The RIMS II multipliers are based on fixed inter-industry relationships in the 2010 national input-output (I-O) accounts developed by BEA. To develop multipliers for the Knoxville MSA, the national I-O relationships were adjusted to reflect the industrial structure and trading patterns in the region's economy as of 2010. These adjustments are based on knowledge and assumptions about the extent to which increases in demand for intermediate goods and services will be supplied by businesses located within the KMSA.

The employment and earnings multipliers shown in Table 2 for the health care subsectors are total (Type II) multipliers. These multipliers include *direct*, *indirect* and *induced* economic impacts. To

illustrate, suppose 100 workers are hired to undertake a construction project (direct impact). Employment will increase by more than the 100 jobs directly tied to the project. As the materials and equipment needed to complete the project are purchased, additional jobs are created in the businesses that supply these materials and equipment (indirect impact). Lastly, as people are put to work, directly and indirectly, they purchase more consumer goods and services. This new spending creates jobs in industries that supply consumer goods and services (induced impact). The combined indirect and induced impacts are often referred to as *spillover* impacts.

Multipliers for Health Care Subsectors

The multipliers reported in Table 2 for the three health care subsectors show that the hospital and the ambulatory health care services subsectors have significantly larger employment multipliers than the nursing and residential care facilities subsector. The creation of 100 new jobs in the ambulatory health care services and hospitals subsectors supports the creation of 92 and 90 new jobs, respectively, in other sectors of the KMSA economy; creation of 100 new jobs in the nursing & residential care subsector supports 45 new jobs in other sectors of the economy.

An even larger difference is evident in the earnings per job multiplier: for every new job created in the ambulatory services subsector, total annual earnings received by households employed in all industries in the KMSA increase around \$100,000, more than double the value for nursing and residential care facilities. The earnings per job multiplier for hospitals is about midway between those for the other two subsectors. The differences in the earnings per job multipliers primarily reflect disparities in average monthly earnings among the three subsectors (see Table 1).

Table 2. Economic Impact Multipliers, Health Care Subsectors, Knoxville MSA			
	Jobs multiplier ^{1,2}	Earnings multiplier ^{1,3}	Earnings per job multiplier ⁴
Row Industry:			
Ambulatory health care services	1.9163	1.5208	\$ 100,025
Hospitals	1.9034	1.6604	\$ 72,825
Nursing & residential care facilities	1.4467	1.5214	\$ 42,720
¹ Bureau of Economic Analysis (BEA), US Dept. of Commerce			
² Total increase (decrease) in the number of jobs in all industries for each additional job created (lost) in the row industry.			
³ Total dollar change in earnings of households employed in all industries for each additional dollar of earnings paid to households employed in the row industry.			
⁴ Total increase (decrease) in annual earnings of households employed in all industries for each job created (lost) in the row industry, \$ 2012. Calculated by the author.			

Health Care Sector: Total Economic Impact

The impact multipliers presented in Table 2 include the impact for each healthcare subsector on employment and earnings in all industries, including the other two subsectors. To avoid double – counting when estimating the economic impact of the overall health care sector, the multipliers in Table

2 were adjusted to remove linkages among the health care subsectors. The adjusted multipliers are presented in Table 3.

Table 3. Adjusted Economic Impact Multipliers, Health Care Subsectors and Total Health Care, Knoxville MSA			
Row Industry:	Jobs multiplier ¹	Earnings multiplier ¹	Annual earnings per job multiplier
Ambulatory health care services	1.7649	1.4033	\$ 92,300
Hospitals	1.7735	1.5316	\$ 67,175
Nursing and residential care facilities	1.3853	1.4263	\$ 40,050
Health care, total sector	1.7121 ²	1.4619 ²	\$ 74,170 ³
¹ Estimated by the author from information supplied by BEA.			
² Weighted (by subsector jobs) averages of the subsector multipliers. Calculated by the author.			
³ Calculated as: 1.4619 times \$ 4,228 times 12. Average monthly earnings for the health care sector are \$ 4,228 (Table 1).			

The adjusted multipliers allow us to estimate the contribution of the overall health care sector to the Knoxville MSA economy. The following observations are noteworthy:

- The jobs multiplier of 1.7121 indicates that 100 health care jobs support another 71 jobs in all other sectors of the economy. As of 2012, there were 73,095 jobs directly and indirectly supported by the provision of health care services in the region (1.7121* 42,693). This included 42,693 direct health care sector jobs and 30,402 health-care-supported jobs in other sectors of the local economy. Health care, directly and indirectly, accounted for 21.9 percent of total employment in the region.
- During the 2000-2012 period, employment in the health care sector increased by 910 jobs per year. An additional 910 health care jobs support 650 jobs in other sectors of the Knoxville area economy. The annual gain in total employment due to expansion in the health care sector is, consequently, 1,560 jobs (1.7121*910).
- The earnings multiplier for the total health care sector is 1.4619. This means that for each additional \$100 of wages paid to households employed in the health care sector, an additional \$46 is earned by households employed in other sectors of the KMSA economy. Whereas, the health care sector accounts directly for 14.0 percent of annual wages earned by households in the region, the earnings multiplier demonstrates that 20.5 percent of wages earned by all households in the KMSA may be traced back to the health care sector (14.0 percent * 1.4619).

- The earnings per job multiplier suggests that 100 health care jobs add, directly and indirectly, around \$7.4 million in annual earnings paid to households employed by all industries in the region.

Conclusions

The health care sector has contributed significantly to economic growth in the Knoxville MSA. Growth in the health care sector in the Knoxville area, as elsewhere, has been fueled largely by demographic forces... namely, an ageing population. These forces are expected to continue in the future. The biggest source of uncertainty as to whether past trends in health care employment will continue or are changed in a meaningful way may be implementation of the Affordable Care Act, popularly known as ObamaCare. While demand for health care services is likely to expand, the composition of that demand may be significantly altered with implementation of the new law. This alteration likely will be increased emphasis on preventive care and a shift of resources to the ambulatory health care subsector. This subsector, among the three subsectors studied, has by far the largest earnings per job multiplier.

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