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By Sherry Glied, Stephanie Ma, and Claudia Solis-Roman

# Where The Money Goes: The Evolving Expenses Of The US Health Care System

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**ABSTRACT** National health care expenditures constitute revenue to the health care system. However, little is known about how this revenue is distributed across sectors. This article calculates revenues and detailed expenditures for physicians' offices, hospitals, and outpatient care centers in 1997, 2002, 2007, and 2012, using a range of Census Bureau and Bureau of Labor Statistics sources. Between 1997 and 2012, spending on these three sectors rose by \$580 billion, and employment rose by 1.7 million people. Just under half of all 2012 revenues were spent on labor compensation. The labor compensation share of spending declined slightly; within these sectors, the share of compensation paid to physicians and nurses increased. Although employment of nonprofessional labor grew during the study period, this group did not account for much of the sector's increased spending. The plurality of the 1997–2012 spending increase went to producers of purchased materials and services, which now account for more than one-third of payments.

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**H**ealth expenditures have been rising faster than the general rate of US inflation for many years. As Uwe Reinhardt has pointed out, however, “Every dollar of health care expenditures is someone’s health care income.”<sup>1</sup> Spending is tracked routinely, but much less is known about where the money goes. In this article we decompose spending in three categories—hospital, physician, and outpatient—to provide a sense of who collects the revenue and how the shares received have changed over time. This analysis reveals that purchases of medical services and increased compensation of highly skilled professionals accounted for the plurality of spending growth in the time period we examined.

## Background

US health expenditures increased from \$1.5 trillion in 1997 to \$2.8 trillion in 2012—an increase

of 4 percentage points in the health care sector’s share of gross domestic product (GDP).<sup>2,3</sup> In 2015 nearly one of every six dollars of production in the US economy (17.5 percent) occurred in the health care sector.<sup>3</sup> Consistent with that figure, over one in seven American workers is employed in the health care sector.<sup>4</sup>

A second important source of information about health spending is the Bureau of Economic Analysis (BEA) GDP Input-Output and National Income and Product Accounts. The BEA aggregates and reports input-output data for hospitals, ambulatory health care services, and nursing and residential care facilities. However, the BEA’s estimates exclude public entities, such as state and local hospitals, that are included in this study and in the NHEA.<sup>5,6</sup> The BEA adjusts data to balance accounts across the national economy and ensures that the same good or service is not double-counted when it is initially produced and when it is used to produce another good or service.<sup>7</sup> Jeffrey Werling and coauthors pub-

lished a study describing the supply side of the health care sector in 1998 and 2012 using the BEA's input-output methodology. They used the BEA accounts to compare health care spending to the rest of the economy using standardized input and output groupings.<sup>4</sup>

Prior research has shown that the BEA and NHEA data are relatively close to each other in their estimates of total national health spending in a given year; they differ in their estimates of spending by subcategory.<sup>6</sup> Reconciliation studies generally do not disaggregate to specific provider settings or compensation categories.<sup>4,6</sup>

In addition to efforts to reconcile accounts, there has been considerable research on administrative employment and expenditures in the sector.<sup>8-11</sup> A further strand of research has examined patterns of employment within the health care sector, including recent work relating these patterns to health care expenditures.<sup>12-15</sup>

### Study Data And Methods

Our purpose in this article is to describe the recipients of health services delivery revenue—revenue associated with physicians' offices, hospitals, and outpatient care centers—in a way that describes the allocation of spending in the health care sector and is relevant to health care policy decisions. This goal requires somewhat different accounting than prior studies have used. It means, for example, separating health care professionals from less skilled employees; distinguishing medical supplies from other purchased materials; separating physicians' offices from outpatient surgical and diagnostic centers; and including as revenue funds received by hospitals that are then used to build new structures.

To this end, we analyzed detailed source data from the Bureau of Labor Statistics and the Economic Census, conducted in 1997, 2002, 2007, and 2012 (years of the release of Economic Census benchmark industry data) and from the Economic Census's annual industry accounts (Service Annual Survey [SAS] 2007-12 and Business Expenses Survey [BES] 1997-2002).

We aggregated these data into our three sector categories using the North American Industry Classification System (NAICS) and the Standard Industrial Classification System (SIC; see the online Appendix).<sup>16</sup> Although these are the same sources used by the BEA in its analyses, we did not adjust these data to fit into the BEA's standardized categories, and we did not calibrate the survey responses to national aggregates as the BEA does. For example, intermediate spending for materials and purchased services in the BEA KLEMS accounts<sup>17</sup> does not align with our categories of intermediate spending because we

treated responses of "other" as a distinct category, instead of allocating this spending to standard categories as the BEA does. While we used internally consistent methods across the period and industries in our study, our figures do not entirely correspond to prior work because of these differences in classification.

All figures are reported in constant 2012 dollars using the GDP Price Index.<sup>18</sup> Appendix 1 provides details of our methodology.<sup>16</sup>

**TOTAL REVENUE** Total revenue figures for the three sectors were derived from the Economic Census. These estimates are close to the NHEA's personal health care expenditure categories.

**INTERMEDIATE COSTS** Data on intermediate costs (the total monetary value of goods and services consumed or used up as inputs in production by enterprises) were obtained from the SAS and BES of the Economic Census. These sources provide line-item estimates of intermediate costs, including medical supplies, purchased services, and depreciation and amortization, as well as all other operating expenses.

**LABOR COSTS** Total labor costs include the sum of expenses on wages, benefits, and contract labor. We used the Occupational Employment Statistics (OES) from the BLS to calculate total wage expenses by industry and by occupation, because these data are more disaggregated than those in the SAS. The OES survey collects data on wage and salary workers but not self-employed workers.<sup>19</sup> We lacked data on self-employment earnings, but prior research indicates that these earnings account for less than 2.5 percent of employee compensation in the health sector. The share of physicians who report self-employment income—the most common self-employed group in our study—fell from 13 percent in 1997 to 8 percent in 2012.<sup>20</sup> Total wage expense is calculated for each industry by multiplying the number of employees by the average annual earnings (not including benefits) of each occupational group. Contract labor costs and employer costs for fringe benefits were obtained from the BES and SAS. To estimate benefit plus wage compensation, benefits for each industry (taken from the BES and SAS) were allocated in proportion to wages reported by the BLS.

**CAPITAL EXPENSES** Total capital expenses (including structures and equipment) by industry were taken from the Census Bureau's Annual Capital Expenditure Survey.

**TAX EXPENSES** The SAS and BES surveys collect data on governmental taxes and licenses fees paid by establishments. This does not include any income taxes or sales or excise taxes collected from customers.<sup>21,22</sup>

**TOTAL EXPENSES AND SURPLUS** We calculated total expenses by summing expenses drawn

from the SAS and BES and our computed labor costs from the OES (in place of the SAS/BES compensation figure). Surplus, which may also include accounting differences not otherwise captured, was calculated by subtracting total expenses from total revenue for each of the three sectors for each industry. We did not include capital expenses from the Annual Capital Expenditure Survey in our total expense calculations; therefore, funds subsequently spent on capital were included as part of our surplus estimates. Surplus may be returned to shareholders, compensate self-employed clinicians, be distributed as community benefits by nonprofits, or be re-invested in capital projects.

## Study Results

**DISTRIBUTION OF HEALTH SYSTEM REVENUES** In 2012, personal health consumption expenditures were \$2,336 billion, or 84 percent of overall US health expenditures—a large portion of the revenue of the broader health care sector.<sup>23</sup> This article provides a detailed decomposition of \$1,377 billion of these expenditures (hospital care, physician and clinical services, and outpatient services; see Appendix Exhibit 1).<sup>16</sup> Together, these three sectors account for a steady share of US health expenditures (about half of the total) since 1997.

In 2012, revenues exceeded expenses by 10.2 percent across the three sectors overall (Exhibit 1). Half of all revenue was paid to workers, consistent with previous findings (Exhibit 2).<sup>15</sup> Major occupational groups in the health care workforce include physicians and nurses; other health care practitioners and support staff; and management, administration, and information technology (IT) staff. Nearly half (46.5 percent) of all labor compensation going to these three industry groups, or 23.1 percent of total sector revenue, paid the wages and benefits of physicians and nurses (Exhibit 2). Other health care practitioners and support staff accounted for 11.7 percent of total sector revenue in 2012, while other employees, including those in administration and management and IT, as well as contract labor, together accounted for 14.9 percent of total sector revenue (Exhibit 2). The next-largest class of recipients of revenue was made up by producers of intermediate goods and services. Over 35 percent of total revenue (\$492 billion) went toward these purchases (Exhibit 2).

Intermediate costs were divided roughly equally among medical supplies, services purchased externally, and other operating costs (33.4 percent, 30.3 percent, and 30.8 percent, respectively). About 36.7 percent of purchased service costs was spent on professional and tech-

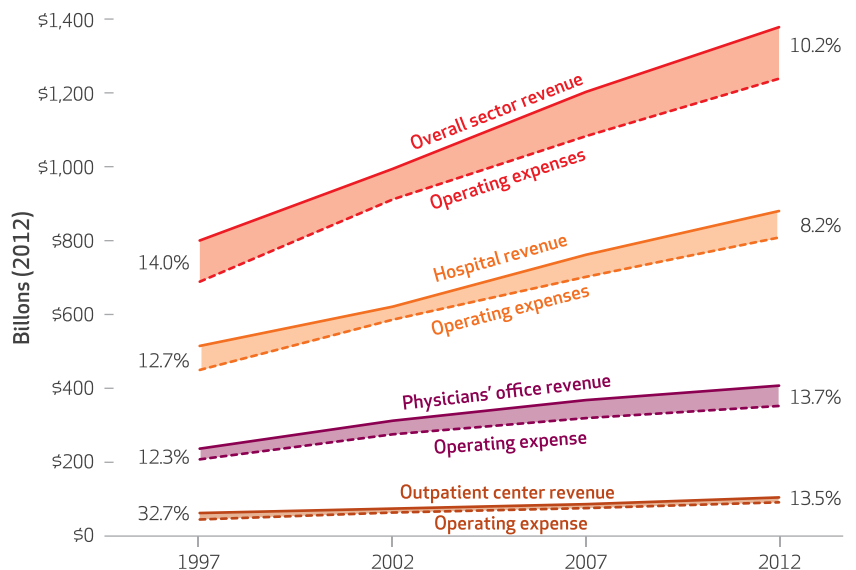
nical services, including accounting, legal, and engineering services. Five percent of total revenue was spent on capital investments (figures in this paragraph were computed from Appendix Exhibit 1).<sup>16</sup>

Comparing across the three subsectors studied, almost half of hospital revenue (48.8 percent) was paid as labor compensation; patterns for outpatient care centers were similar (47.4 percent) (see Appendix Exhibit 1).<sup>16</sup> Physicians' offices were somewhat more labor-intensive than hospitals, though: 52.5 percent of the revenue they received was paid to employees.<sup>16</sup> This is likely to be an underestimate because we did not account for self-employment income. Hospitals spent 37.6 percent of revenue on intermediate expenses, while physicians' offices and outpatient centers spent somewhat smaller shares of revenue (31.8 percent and 35.7 percent, respectively) (see Appendix Exhibit 2).<sup>16</sup>

**TRENDS IN INDUSTRY REVENUE AND EXPENDITURES SINCE 1997** From 1997 to 2012, total revenues (in constant 2012 dollars) across the three sectors overall rose from \$797 billion to \$1,377 billion (Exhibit 1, Appendix Exhibit 1).<sup>16</sup> From 2002 to 2012, total expenses of physicians' offices and hospitals increased at a slightly lower rate than revenues. By contrast, growth in total expenses exceeded that of revenues in outpatient

### EXHIBIT 1

**Growth in revenues and expenses, and surpluses, in the health sector and three subsectors, selected years 1997–2012**

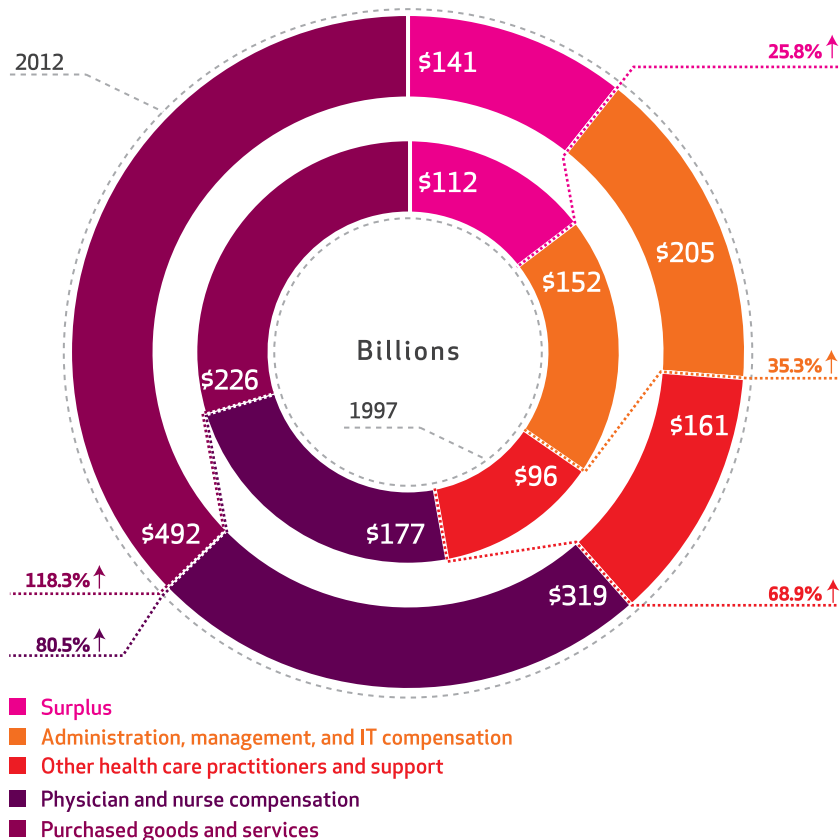


**SOURCE** Authors' analysis of data from the following sources: Economic Census, Business Expenses Survey (BES) 1997–2002 and Service Annual Survey (SAS) 2007–12; Bureau of Labor Statistics, Occupational Employment Statistics; and Bureau of the Census, Annual Capital Expenditure Survey.

**NOTES** Dollar figures are in billions of constant 2012 dollars. Total revenue growth from 1997 to 2012 for the overall sector was 72.8 percent. Shaded areas represent surplus overall and for each subsector.

EXHIBIT 2

Change in the distribution of components of inflation-adjusted health care revenues, 1997 to 2012



**SOURCE** Authors' analysis of data from the following sources: Economic Census, Business Expenses Survey (BES) 1997–2002 and Service Annual Survey (SAS) 2007–12; Bureau of Labor Statistics, Occupational Employment Statistics; and Bureau of the Census, Annual Capital Expenditure Survey. **NOTES** Dollar figures are in billions of constant 2012 dollars. See Exhibit 1 for estimates of surplus, purchased goods and services, and general compensation in 1997, 2002, 2007, and 2012. See Exhibit 4 for earnings growth by health-sector occupation between 1997 and 2012. Components do not add up to total revenue because depreciation and taxes (3.8 percent of revenue in 1997 and 4.2 percent of revenue in 2012) are not shown. IT is information technology.

care centers over this period (Exhibit 1, Appendix Exhibit 1).<sup>16</sup> Surplus as a share of revenues rose slightly and steadily over time for physicians' offices.<sup>24</sup> For hospitals, it fell by seven percentage points between 1997 and 2002, as the effects of the Balanced Budget Act took effect, and it rose slightly from 2007 to 2012, despite the recession. Surplus was much more volatile in outpatient care centers. Revenues exceeded expenses in this sector by 32.7 percent in 1997, after a period of rapid growth during the 1990s; by 2007, revenues were 13.1 percent higher than expenses, aligning more closely with hospitals and physicians' offices (Exhibit 1). Across the three sectors combined, surplus as a share of revenue dropped by 6 percentage points between 1997 and 2002, increased by 2 percentage points between 2002 and 2007, and

increased by 0.2 percentage points between 2007 and 2012 (Exhibit 1; Appendix Exhibit 1).<sup>16</sup>

**INTERMEDIATE COSTS** The most rapidly growing component of expenses (118.3 percent growth) across the three sectors was intermediate costs for goods and services, which grew much faster than revenue, total expenses, and total compensation from 1997 to 2012, with growth most rapid in the earlier 1997–2002 period (Exhibit 2; Appendix Exhibit 1). In 1997, intermediate costs for goods and services accounted for 28.3 percent of revenues across these three sectors; by 2012, 35.7 percent of total revenue went to these purchases (Exhibit 2). Over the 2002–12 period (where intermediate costs can be decomposed further), the main driver of this growth was expenses for purchased materials (Appendix Exhibit 1).<sup>16,25</sup> From 2007 to 2012, where this materials breakdown can be further decomposed, spending for medical supplies increased somewhat more rapidly than that for other supplies (Appendix Exhibit 1).

**LABOR COMPENSATION** The increase in spending on intermediate goods and services was offset by a slight decline in the share of industry revenue devoted to labor compensation, which fell from 53.2 percent to 49.8 percent for the three labor categories combined (Exhibit 2). It declined most sharply in hospitals (from 54.1 percent to 48.8 percent; see Appendix Exhibit 1).<sup>16</sup> Compensation lagged revenue growth during both the 1997–2002 years and the 2002–07 boom years, then grew slightly faster than revenue in the 2007–12 recession years (Appendix Exhibit 1).<sup>16</sup> Although growth in labor expenses was slower than growth in total revenue across the three health subsectors, growth in both employment and earnings greatly outpaced economywide averages (Exhibits 3 and 4). Inflation-adjusted total compensation across the subsectors grew by 61.8 percent from 1997 to 2012 (computed from Appendix Exhibit 1).<sup>16</sup>

We further decomposed compensation into employment and earnings growth for select occupational groups (Exhibits 3 and 4). Total employment across the three health subsectors rose by 1.7 million people from 1997 to 2012, a 24.5 percent increase—much greater than the 11.3 percent increase in employment across the overall economy during this period (Exhibit 3). The average annual earnings for health care workers rose from about \$46,600 to \$59,800 from 1997 to 2012, an increase of 28.3 percent—nearly double the 14.9 percent increase in average earnings across the economy (Exhibit 4).

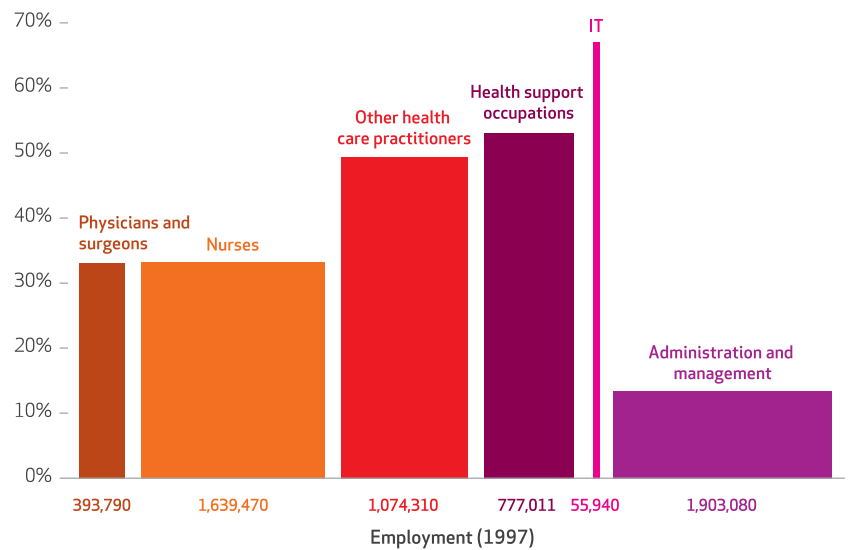
The highly skilled share of the health care sector workforce grew over time. In 1997 one in every 17.8 people working in the three health subsectors was a physician; this ratio rose to

one in 16.6 by 2012, as the number of employed physicians grew by nearly one-third—faster than the sectorwide employment growth rate of 24.5 percent (Exhibit 3). Inflation-adjusted earnings growth for physicians also outpaced both the overall health care sector and the economywide averages, rising by 35.3 percent during this period (Exhibit 4). A small part of this growth may reflect a shift from self-employment income (not included in our compensation totals) to wage and salary compensation. Nursing employment, which began the period as a large share of total employment, also grew rapidly across the three sectors (33.2 percent)—three times as rapidly as the 11.3 percent rate of overall US employment (Exhibit 3). Nurses' average inflation-adjusted earnings increased by 30.6 percent over this period (Exhibit 4). Combining employment growth and earnings plus benefits growth, the share of total revenue in this sector paid to physician and nurses grew by 80.5 percent from 1997 to 2012 (Exhibit 2).

Employment of other health care practitioners (excluding health care support), such as lab technologists, technicians, and therapists, grew by nearly 50 percent from 1997 to 2012—nearly five times the 11.3 percent growth rate in the overall economy (Exhibit 3). The inflation-adjusted average earnings of this group, however, grew only slightly, and much more slowly (6.3 percent) than both the average across the three health subsectors (28.3 percent) and the economywide average (14.9 percent) (Exhibit 4). This slow earnings growth offset the rapid growth in employment, so that the share of industry compensation paid to this group scarcely changed over the period (data not shown).

The most rapid increase in employment occurred across health care support occupations, which includes aides and other assistants. This group increased by 53.1 percent (Exhibit 3). Growth was particularly strong in physicians' offices, where health care support employment more than doubled during this period. The inflation-adjusted wages of this group (16.2 percent), however, grew more slowly than the health care industry average (28.3 percent) (Exhibit 4). The rapid rise in employment thus had only a small effect on the share of total sector compensation paid to this group (not shown).

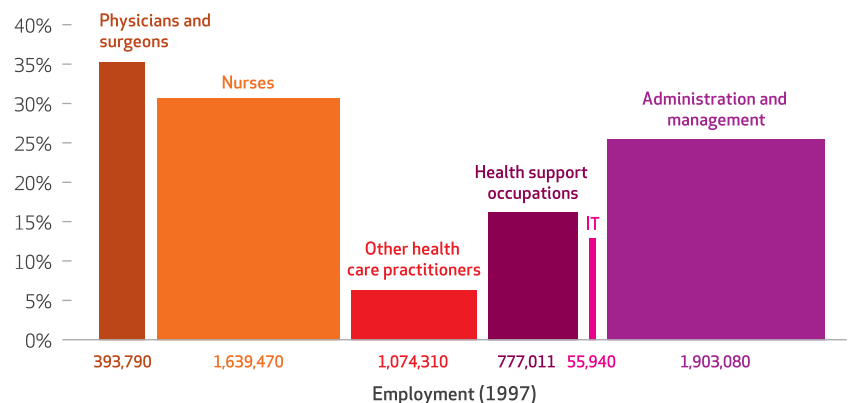
The share of employment in the health care industry consisting of IT positions, not including health technician occupations, was very small in 1997 but has been growing. Employment in IT grew by nearly 37,500 new positions—an increase of 67.0 percent from 1997 to 2012. This growth greatly outpaced the 24.5 percent increase in employment in the health care sector overall (Exhibit 3). Average earnings of those in

**EXHIBIT 3****Change in employment for selected health-sector occupational groups from 1997 to 2012**

**SOURCE** Authors' analysis of data from the Bureau of Labor Statistics, Occupational Employment Statistics. **NOTES** Column widths for occupations reflect the numbers employed in 1997. Workforce sizes for 2012 are provided in the online Appendix; see Note 16 in text. For the sake of comparison, employment growth from 1997 to 2012 in the health care sector overall was 24.5 percent; for the economy at large, it was 11.3 percent. Health care sector categories are from the North American Industry Classification System (NAICS). IT is information technology.

IT rose just 12.9 percent over this period (Exhibit 4). Earnings increased most rapidly for those in IT occupations employed in outpatient care centers (not shown).

The number of administrative and managerial

**EXHIBIT 4****Growth in earnings for health-sector occupational groups from 1997 to 2012**

**SOURCE** Authors' analysis of data from the Bureau of Labor Statistics, Occupational Employment Statistics. **NOTES** Column widths for occupations reflect the numbers employed in 1997. Workforce sizes for 2012 are provided in the online Appendix; see Note 16 in text. For the sake of comparison, inflation-adjusted earnings growth from 1997 to 2012 in the health care sector overall was 28.3 percent; for the economy at large, it was 14.9 percent. Earnings exclude benefit compensation. Health care sector categories are from the North American Industry Classification System (NAICS). IT is information technology.

positions across the three sectors grew much more slowly (13.4 percent) than overall health care employment over this period (24.5 percent), such that the administrative share of total health-sector employment declined. Average annual earnings of administrative and managerial workers in health care also grew more slowly (25.5 percent) than the sector average (28.3 percent), although more quickly than economywide earnings (14.9 percent) (Exhibit 4). As a consequence, the share of total health care compensation paid to administrative and managerial occupations declined during this period. One possible explanation for the slower growth rate is the outsourcing of administrative services. However, over the 2002–12 period (years for which data are available), spending on purchased (outsourced) services overall grew only at about the same rate as total compensation, which suggests that no substantial shift in such services occurred during this period.

### Discussion

Effectively controlling health care costs requires an understanding of how and where costs have grown. Our results suggest that regulatory and market changes, economywide trends, and changes in technology have all influenced where the money in the health sector goes. During 1997–2012, health care providers managed declining reimbursement from public payers alongside heightened scrutiny and more intensive negotiations by private payers over reimbursements.<sup>26</sup> Our results show that these forces have had differential impacts across the sector and over time. Targeted regulatory changes like the Balanced Budget Act have had direct effects on provider surpluses.<sup>27</sup> Hospitals were hit hard by the Balanced Budget Act in the early 2000s; outpatient centers did not generate nearly as much surplus in the 2000s as they did in the late 1990s. But providers seem to have been able to adjust expenses to address broader, longer-term trends. During the 2007–12 recession, when demand for services slowed, overall revenue growth across the sectors moderated, with revenues growing only at about two-thirds the pace they had between 2002 and 2007, but growth in expenses also declined. As a consequence, for each group of providers we studied, the percentage surplus of revenues over expenses was almost identical in 2012 to its 2007 level.

Health care delivery is a labor-intensive sector, and labor compensation remains the single largest contributor to costs. However, the labor compensation share has declined slightly since 1997, and the decline is not due to a shift toward outsourcing of services. Instead, there appear to be

at least a few opportunities for substituting capital for labor in the health care sector, at least for administrative and managerial tasks, where employment (and, to a lesser extent, earnings) grew disproportionately slowly over this period. Across the sector as a whole, employment nonetheless grew robustly throughout this fifteen-year period—much faster than the economywide average. However, earnings trends varied substantially across occupations. Low-skill workers in health care, for whom substitutes can be found elsewhere in the economy, saw only modest growth in compensation. By contrast, highly skilled groups with competencies that are specific to the health care sector saw much more rapid growth. Health professional groups registered exceptional increases in inflation-adjusted compensation.<sup>20</sup> The compensation of physicians and nurses alone, which accounted for 42 percent of total sector labor compensation across the sectors and 1.24 percent of overall US GDP in 1997, rose to 46 percent of total labor compensation and 1.56 percent of GDP by 2012. This group's rising share in the health care sector suggests that, overall, technological changes in the sector to date have favored, rather than substituted for, those with high skills.

The critical impact of technological change on health care costs can also be seen in the biggest beneficiaries of health sector growth: manufacturers of purchased materials, including medical and nonmedical supplies. Purchased materials now account for about one-seventh of sector revenues. These supplies may include health care-specific goods, such as pharmaceuticals and devices; other sophisticated equipment, such as IT systems; or routine medical-specific or general goods. For most of the sector, apart from administration and management, purchased materials appear to largely complement labor inputs.

### Conclusion

The findings of our study were constructed by pooling multiple data sources. We selected data sources that would allow for a study of disaggregated trends, and we adjusted for changes in survey methodologies and definitions over time. The need to aggregate information across multiple data sources to paint a complete picture of the US health care system calls attention to the need for more routine collection of information on revenue and costs in the industry, building on the efforts of the GDP Input-Output and National Income and Product Accounts from the Bureau of Economic Analysis, which provide some, but not all, of this information.<sup>4,28</sup>

Changes in the health care sector—including the development of new delivery systems and the

introduction of new technologies—are likely to alter where the money in the sector goes and who receives how much of it in the future. Monitoring

these aggregates therefore serves as a useful corollary to studies of specific reforms and a necessary element in sensible policy design. ■

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## NOTES

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- 24 Capital expenditures are included in our estimates of revenues.
- 25 The SAS definition of purchased materials includes medical supplies; expensed equipment such as computer hardware and copiers (excludes leased or rented equipment); and expensed purchases of other materials such as office and janitorial supplies, containers, and other packaging materials.
- 26 Stanton MW, Rutherford MK. Reducing costs in the health care system: learning from what has been done [Internet]. Rockville (MD): Agency for Healthcare Research and Quality Rockville; 2002 [cited 2016 Jun 6]. (Research in Action, Issue No. 9, AHRQ Pub. No. 02-0046). Available from: [http://archive.ahrq.gov/research/findings/fact\\_sheets/costs/costria/costsria.pdf](http://archive.ahrq.gov/research/findings/fact_sheets/costs/costria/costsria.pdf)
- 27 Dickler R, Shaw G. The Balanced Budget Act of 1997: its impact on US teaching hospitals. *Ann Intern Med*. 2000;132(10):820–4.
- 28 The BEA has embarked on a project to improve the way it measures health care spending; see Note 4.