



December 2015

MEDICARE

Increasing Hospital-Physician Consolidation Highlights Need for Payment Reform

GAO Highlights

Highlights of [GAO-16-189](#), a report to congressional requesters

Why GAO Did This Study

Medicare expenditures for HOPD services have grown rapidly in recent years. Some policymakers have raised questions about whether this growth may be attributed to services that were typically performed in physician offices shifting to HOPDs. GAO was asked to examine trends in vertical consolidation and its effects on Medicare.

This report examines, for years 2007 through 2013, (1) trends in vertical consolidation between hospitals and physicians and (2) the extent to which higher levels of vertical consolidation were associated with more E/M office visits being performed in HOPDs. GAO analyzed, using various methods including regression analyses, the most recent available claims data from CMS and survey data from the American Hospital Association, in which hospitals report the types of financial arrangements they have with physicians.

What GAO Recommends

In order to prevent the shift of services from lower paid settings to the higher paid HOPD setting from increasing costs for the Medicare program and beneficiaries, Congress should consider directing the Secretary of the Department of Health and Human Services (HHS) to equalize payment rates between settings for E/M office visits—and other services that the Secretary deems appropriate—and to return the associated savings to the Medicare program. HHS provided technical comments on a draft of this report, which GAO incorporated as appropriate.

View [GAO-16-189](#). For more information, contact James Cosgrove at (202) 512-7114 or cosgrovej@gao.gov.

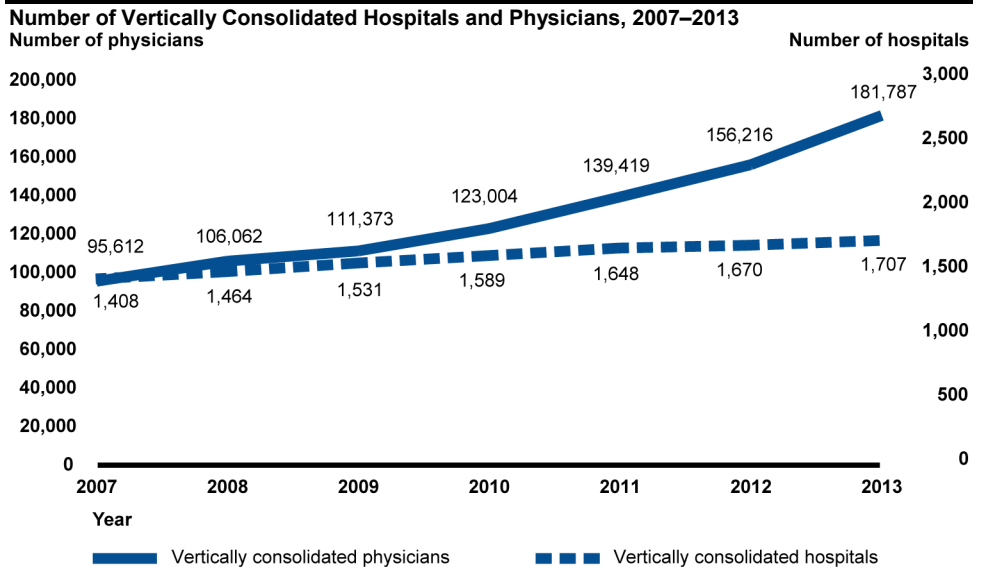
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What GAO Found

Vertical consolidation is a financial arrangement that occurs when a hospital acquires a physician practice and/or hires physicians to work as salaried employees. The number of vertically consolidated hospitals and physicians increased from 2007 through 2013. Specifically, the number of vertically consolidated hospitals increased from about 1,400 to 1,700, while the number of vertically consolidated physicians nearly doubled from about 96,000 to 182,000. This growth occurred across all regions and hospital sizes, but was more rapid in recent years. After hospitals and physicians vertically consolidate, services performed in physician offices, such as evaluation & management (E/M) office visits, can be classified as being performed in hospital outpatient departments (HOPD). Medicare often pays providers at a higher rate when the same service is performed in an HOPD rather than in a physician office. For example, in 2013, the total Medicare payment rate for a mid-level E/M office visit for an established patient was \$51 higher when the service was performed in an HOPD instead of a physician office.



Source: GAO analysis of American Hospital Association data. | GAO-16-189

Note: This analysis was limited to hospitals that served Medicare beneficiaries.

The percentage of E/M office visits—as well as the number of E/M office visits per beneficiary—performed in HOPDs, rather than in physician offices, was generally higher in counties with higher levels of vertical consolidation in 2007 through 2013. For example, the median percentage of E/M office visits performed in HOPDs in counties with the lowest levels of vertical consolidation was 4.1 percent in 2013. In contrast, this rate was 14.1 percent for counties with the highest levels of consolidation. GAO’s findings suggest that Medicare will likely pay more than necessary for E/M office visits. Such excess payments are inconsistent with Medicare’s role as an efficient purchaser of health care services. However, the Centers for Medicare & Medicaid Services (CMS)—the agency that is responsible for the Medicare program—lacks the statutory authority to equalize total payment rates between HOPDs and physician offices and achieve Medicare savings.

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Abbreviations

| | |
|--------|---|
| AHA | American Hospital Association |
| CMS | Centers for Medicare & Medicaid Services |
| E/M | evaluation & management |
| FFS | fee-for-service |
| HCPCS | Healthcare Common Procedure Coding System |
| HHI | Herfindahl-Hirschman Index |
| HHS | Department of Health and Human Services |
| HOPD | hospital outpatient department |
| MedPAC | Medicare Payment Advisory Commission |
| MedPAR | Medicare Provider Analysis and Review |
| OPPS | Outpatient Prospective Payment System |

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December 18, 2015

Congressional Requesters

Medicare expenditures for hospital outpatient department (HOPD) services have grown rapidly, increasing from \$22.4 billion to \$36.3 billion from 2007 through 2013, or about 8.3 percent annually. In comparison, the national economy grew by an average annual rate of 2.4 percent, and total Medicare Part B spending grew by an average annual rate of 5.8 percent over the same period.¹ Some policymakers have raised questions about whether or to what extent the growth in spending on services performed in HOPDs may be attributed to services that were typically performed in physician offices shifting to HOPDs. Such a shift could undermine Medicare's ability to be an efficient purchaser of health care services, given that Medicare often pays providers at a higher rate—sometimes twice as much—when the same service is performed in an HOPD rather than in a physician office.

This difference in Medicare payment rates, based on where a service is performed, provides an incentive for hospitals to acquire physician practices and/or hire physicians as salaried employees—financial arrangements health care experts commonly refer to as vertical consolidation.² Other factors, such as new payment policies that reward coordination, may also incent vertical consolidation. After hospitals and physicians vertically consolidate, the same services that were once reimbursed at a lower total payment rate can be classified as HOPD services and reimbursed by Medicare at a higher total payment rate. For one common type of service that can be performed in both physician offices and HOPDs—evaluation & management (E/M) office visits—several organizations have estimated that equalizing payment rates

¹Medicare Part B covers certain HOPD, physician, and laboratory services, among other services. For Medicare spending figures, see *The 2015 Annual Report of The Boards of Trustees of The Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds* (Washington, D.C.: July 2015).

²Hospitals can employ physicians in multiple ways. For example, a hospital can directly hire physicians or acquire an already established practice. Throughout this report, we refer to hospitals and physicians in such arrangements as vertically consolidated hospitals and physicians, respectively.

between physician offices and HOPDs would save Medicare billions of dollars, with some estimates predicting savings of nearly \$1 billion to \$2 billion a year for the Medicare program and beneficiaries.³

You asked us to examine trends in vertical consolidation and its effects on Medicare. In this report, we examine, for years 2007 through 2013,

1. trends in vertical consolidation between hospitals and physicians and
2. the extent to which higher levels of vertical consolidation were associated with more E/M office visits being performed in HOPDs instead of physician offices.

To examine trends in vertical consolidation between hospitals and physicians from 2007 through 2013, we analyzed data from the American Hospital Association (AHA) Annual Survey Database,TM in which hospitals report the types of financial arrangements they have with physicians and the number of physicians in those relationships.⁴ We limited our analysis to hospitals that served Medicare beneficiaries during this period, which we identified using Medicare Provider Analysis and Review (MedPAR) files.⁵ Additionally, based on a review of pertinent literature, we identified and interviewed academic researchers and industry representatives about the various types of hospital-physician relationships, possible data

³E/M office visits are provided by physicians and nonphysicians to assess patients' health and manage their care. In general, Medicare pays roughly 80 percent of the payment rate for E/M office visits under Medicare Part B, and the beneficiary is responsible for the remaining 20 percent. Savings estimates came from entities such as the Bipartisan Policy Center and Medicare Payment Advisory Commission (MedPAC).

⁴At the time we conducted our analyses, 2013 AHA data were the most recent available. The AHA Annual Survey DatabaseTM is a comprehensive hospital database for health services research that is derived from the AHA annual survey of hospitals, which has been conducted since 1946. The survey is sent out to all hospitals that are open and operating in the U.S., a total of over 6,300 hospitals, and has had an average response rate of 76 percent from 2007 through 2013. Similar to previous research on vertical consolidation, we considered a hospital to be vertically consolidated if it had one of three types of relationships with physicians—an integrated salary, foundation, or equity model. See appendix I for a detailed description of these three arrangements.

⁵MedPAR files contain information on Medicare inpatient discharges for short-term acute care hospitals. At the time we conducted our analyses, 2013 MedPAR data were the most recent available. Limiting our analysis to only hospitals that serve Medicare beneficiaries results in excluding certain types of hospitals, such as Department of Veterans Affairs hospitals.

sources to track vertical consolidation, and health care system policies that could be driving consolidation.

To examine the extent to which higher levels of vertical consolidation were associated with more E/M office visits being performed in HOPDs instead of physician offices, we first examined trends in the setting where E/M office visits were performed.⁶ Specifically, we analyzed Medicare fee-for-service (FFS) claims from the Medicare Part B Carrier and Outpatient claim files from 2007 through 2013 to identify where E/M office visits were performed.⁷ To determine the extent to which higher levels of vertical consolidation were associated with more E/M office visits being performed in HOPDs rather than physician offices, we conducted two analyses. First, we ranked counties into quintiles based on the level of 2013 vertical consolidation in each county. Specifically, the counties in the lowest quintile were considered to have low levels of vertical consolidation, and the next four quintiles were considered to have medium-low, medium, medium-high, and high levels of vertical consolidation, respectively. Within each quintile, we then calculated a number of statistics, such as the median percentage and number of E/M office visits per beneficiary performed in HOPDs. For each quintile, we also calculated descriptive statistics, such as the median risk score, to determine whether counties with higher levels of vertical consolidation had sicker or healthier beneficiaries.⁸ Second, in order to ensure that the relationship between consolidation and where E/M office visits were performed was not spurious, we estimated panel-data regression models. Our models controlled for county characteristics, such as whether a

⁶For the purposes of this report, we focused on E/M office visits. Like E/M office visits, other services, such as imaging and surgical services, often have a higher total Medicare payment rate when performed in an HOPD, and the setting in which these services are performed could be affected by vertical consolidation.

⁷Medicare data from the Carrier file include claims from noninstitutional providers, such as physicians. Medicare data from the Outpatient file include claims from institutional outpatient providers, such as HOPDs. At the time we conducted our analyses, 2013 Outpatient and Carrier data were the most recent available.

⁸A beneficiary's risk score is the ratio of expected health care expenditures for that beneficiary under Medicare FFS relative to the average health care expenditures for all Medicare FFS beneficiaries.

county is urban or rural, and for health care market characteristics, such as the level of competition among hospitals and physicians.⁹

Our analysis has some limitations. While the response rate for the AHA Annual Survey Database™ was generally high for each year—on average, about 76 percent of all hospitals responded—and we made efforts to identify potentially problematic responses, the data on vertical consolidation was self-reported by hospitals. In addition, we were unable to make our measure of vertical consolidation reflect the intensity of vertical consolidation relationships—that is, the number of vertically consolidated physicians per hospital—because of data limitations.

We took several steps to ensure that the data used to produce this report were sufficiently reliable. Specifically, we assessed the reliability of the Medicare claims data we used and the AHA Annual Survey Database™ by interviewing officials responsible for overseeing and collecting these data, including officials from the Centers for Medicare & Medicaid Services (CMS)—the agency that is responsible for the Medicare program. We also reviewed relevant documentation and examined the data for obvious errors, such as missing values and values outside of expected ranges. We determined that the data were sufficiently reliable for the purposes of this report. See appendix I for more information regarding our scope and methodology.

We conducted this performance audit from February 2014 through December 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁹Our use of the AHA Annual Survey Database™ and Medicare claims data to investigate the effects of vertical consolidation builds off of previous research. For example, see: Baker, Laurence C., M. Kate Bundorf, and Daniel P. Kessler. “Vertical Integration: Hospital Ownership of Physician Practices is Associated with Higher Prices and Spending.” *Health Affairs* 33, no. 5 (May 2014).

Background

E/M Office Visits and Other Services with Total Payment Rates that Vary Across Settings

E/M office visits are frequently performed services during which a physician or other provider assesses a patient's health and begins managing his or her care.¹⁰ These services are predominantly performed in two settings—physician offices and HOPDs.¹¹ Medicare FFS paid for approximately 250 million E/M office visits in 2013.

Under Medicare's payment policy, Medicare's total payment rate is higher when an E/M office visit is provided in an HOPD rather than in a physician office.¹² When the service is provided in a physician office, Medicare makes a single payment to the physician at Medicare's physician fee schedule non-facility rate. When the service is provided in an HOPD, Medicare makes two payments—one payment at the physician fee schedule facility rate and another payment to the hospital, typically at the hospital outpatient prospective payment system (OPPS) rate. The total of these two payment rates is higher than Medicare's total payment rate when the service is provided in a physician office. For example, in 2013, the total Medicare payment rate for a mid-level E/M office visit for an established patient—billed under Healthcare Common Procedure Coding System (HCPCS) code 99213—was \$51 higher when the service was performed in an HOPD instead of a physician office (see table 1).

¹⁰To bill Medicare for these services, providers select a Healthcare Common Procedure Coding System (HCPCS) code that best represents the level of E/M service performed based on three elements: patient history, examination, and medical decision making. The combination of these three elements can range from a very limited encounter to a very detailed examination requiring an hour of the provider's time.

¹¹While E/M office visits can be performed in a variety of settings, 98 percent of E/M office visits were performed in physician offices or HOPDs in 2013.

¹²Medicare's total payment rate is higher when an E/M office visit is performed in an HOPD, regardless of whether or not a physician is vertically consolidated. For certain other types of services, Medicare's total payment can be higher when the service is performed in a physician office rather than an HOPD.

Table 1: Medicare Payment Rates for Evaluation & Management Office Visits, by Site of Service, 2013

| HCPCS Code | Total Physician Fee Schedule Non-Facility Payment Rate | HOPD Rate | | | Dollar Difference Between Total Payment Rates |
|------------|--|--------------------------------------|-------------------|-------------------------|---|
| | | Physician Fee Schedule Facility Rate | OPPS Payment Rate | Total HOPD Payment Rate | |
| 99201 | \$44 | \$26 | \$57 | \$83 | \$39 |
| 99202 | 75 | 49 | 74 | 123 | 48 |
| 99203 | 108 | 75 | 97 | 172 | 64 |
| 99204 | 165 | 128 | 128 | 257 | 92 |
| 99205 | 204 | 165 | 176 | 340 | 137 |
| 99211 | 20 | 9 | 57 | 66 | 45 |
| 99212 | 44 | 25 | 74 | 98 | 54 |
| 99213 | 73 | 50 | 74 | 123 | 51 |
| 99214 | 107 | 77 | 97 | 174 | 67 |
| 99215 | 143 | 108 | 128 | 236 | 93 |

Source: GAO analysis of Centers for Medicare & Medicaid Services data. | GAO-16-189

Notes: Healthcare Common Procedure Coding System (HCPCS), hospital outpatient department (HOPD), outpatient prospective payment system (OPPS). Evaluation & management office visits are provided by physicians and nonphysicians to assess patients' health and manage their care. The Medicare physician fee schedule and OPPS are two distinct payment systems. The payment rates established under each system are governed by separate requirements. The total HOPD payment rate may not be equal to the sum of its parts and the dollar difference between total payment rates may not be equal to the actual difference due to rounding.

While CMS modified the manner in which Medicare pays for E/M office visits after 2013, large differences in total payment rates continue to exist for E/M office visits. Beginning in 2014, CMS made the OPPS payment rate the same for all the HCPCS codes for E/M office visits. However, the new uniform OPPS payment rate combined with the physician fee schedule facility payment rate for E/M office visits provided in HOPDs continues to exceed the payment rate for the same services performed in physician offices. For example, in 2015, Medicare's total payment rate for E/M office visits ranged from \$58 to \$86 higher when performed in an HOPD compared to a physician office, depending on the specific HCPCS code billed.

Many other services, such as imaging and surgical services, are also reimbursed at a higher rate by Medicare when performed in HOPDs versus other settings.¹³ For example, Medicare's total payment rate for magnetic resonance imaging of the lumbar spine without dye (HCPCS code 72148) was about \$29 higher when performed in an HOPD compared to a physician office in 2013. Furthermore, Medicare's total payment rate for cataract surgery (HCPCS code 66984) was about \$760 higher when performed in an HOPD compared to an ambulatory surgical center in 2013.

Some industry groups argue that higher payment rates for services performed in HOPDs are justified because hospitals treat sicker patients, incur higher costs due to the need to furnish emergency services, and provide services that are unavailable elsewhere in the community for vulnerable populations, such as those dually eligible for Medicare and Medicaid. However, in separate reports, MedPAC and the Department of Health and Human Services (HHS) Office of Inspector General have recommended or suggested that Congress eliminate or reduce differences in Medicare total payment rates across settings for various services, including E/M office visits, imaging services, and surgical

¹³When provided in HOPDs, the OPPS payment rate for certain services includes dependent, ancillary, supportive, and adjunctive items, which are packaged into a single payment rate for the primary service. For E/M office visits, MedPAC found, in 2012, that packaged services account for a small percentage of total costs—about 2.5 percent. For other services, packaged items could represent a higher share of total costs.

services.¹⁴ To date, legislation fully addressing these recommendations has not been enacted.¹⁵

Billing Practices after Vertical Consolidation between Hospitals and Physicians

Recent research suggests that hospitals and physicians are increasingly vertically consolidated, which allows services to shift from physician offices to HOPDs.¹⁶ When hospitals and physicians vertically consolidate, the hospital-owned practice must meet certain criteria to gain what is known as provider-based status, which allows the hospital to bill the HOPD rate, thereby increasing Medicare's total payment rate for the same service.¹⁷ For example, the physician practice and hospital must be financially and clinically integrated. Further, although exceptions exist, physician practices are generally required to be within 35 miles of the hospital to gain provider-based status.¹⁸ If a practice meets these conditions, Medicare's total payment rate for the same service can be

¹⁴See Medicare Payment Advisory Commission, *Report to the Congress: Medicare Payment Policy* (Washington, D.C.: March 2012), which recommended that Congress enact legislation to equalize payment rates for E/M office visits provided in HOPDs and physician offices; *Report to the Congress: Medicare and the Health Care Delivery System* (Washington, D.C.: June 2013), which suggested that Congress could eliminate or reduce payment differences for services such as imaging and surgical services; and Department of Health and Human Services Office of Inspector General, *Medicare and Beneficiaries Could Save Billions if CMS Reduces Hospital Outpatient Department Payment Rates for Ambulatory Surgical Center-Approved Procedures to Ambulatory Surgical Center Payment Rates* (A-05-12-00020) (April 2014), which recommended that HHS seek legislation to exempt lowering the OPPS rates for ambulatory surgical center approved procedures from OPPS budget neutrality requirements.

¹⁵As a result of legislation enacted November 2, 2015, services furnished by off-campus HOPDs (i.e., HOPDs that are not located on a hospital campus) are excluded from the OPPS, effective January 1, 2017. However, this exclusion will not apply to services furnished by providers billing as HOPDs prior to enactment of the legislation—that is, all providers billing as HOPDs during our study—who would continue to be paid under the OPPS or to services provided by on-campus HOPDs. See Bipartisan Budget Act of 2015, Pub. L. No. 114-74, § 603, 129 Stat. 584, 597-598 (2015).

¹⁶See Kane, CK and Emmons, DW. "Policy research perspectives – New data on physician practice arrangements: private practice remains strong despite shifts toward hospital employment." American Medical Association, 2013.

¹⁷A provider-based entity comprises both the specific physical facility and the personnel and equipment needed to deliver the services at that facility.

¹⁸For example, a physician practice can gain provider-based status, even if the practice is located more than 35 miles away from the hospital, if the hospital and physician practice serve the same patient populations. For more information regarding provider-based status, including a list of requirements providers must meet to gain provider-based status, see 42 C.F.R. § 413.65(b) (2014).

substantially higher despite the fact that the practice's location, the physicians who practice there, and the beneficiaries served could be the same as before consolidation occurred.

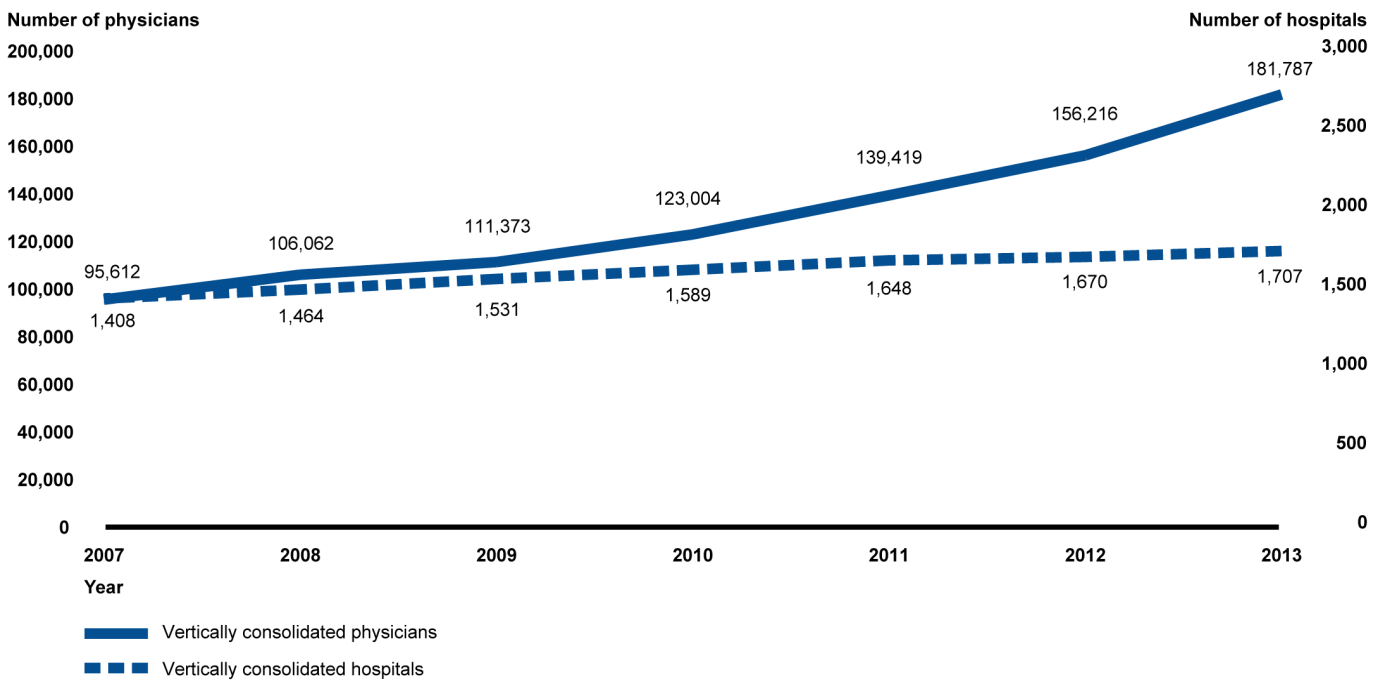
Data Indicate an Increase in Vertical Consolidation between Hospitals and Physicians from 2007 through 2013

Our analysis of AHA survey data shows that from 2007 through 2013, the number of vertically consolidated hospitals increased by 21 percent. Specifically, out of the approximately 4,700 surveyed hospitals included in our study, 1,408 or 30 percent of the hospitals reported having a vertical consolidation arrangement with physicians in 2007.¹⁹ This number increased to 1,707 or 36 percent in 2013—an average annual increase of 3.3 percent (see fig. 1).

In addition, AHA survey data also show that the number of vertically consolidated physicians nearly doubled between 2007 and 2013, with faster growth toward the end of this time period. Specifically, the number of these physicians increased from over 95,000 in 2007 to almost 182,000 in 2013—an average annual increase of 11.3 percent (see fig. 1). From 2010 to 2013, the number of vertically consolidated physicians grew at an average annual rate of 13.9 percent, compared to a rate of 8.8 percent from 2007 to 2010.

¹⁹We limited our analysis to include hospitals in the AHA Annual Survey Database™ that served Medicare beneficiaries on an inpatient basis based on our analysis of Medicare claims data, which resulted in about 4,700 hospitals for each year.

Figure 1: Number of Vertically Consolidated Hospitals and Physicians, 2007 through 2013

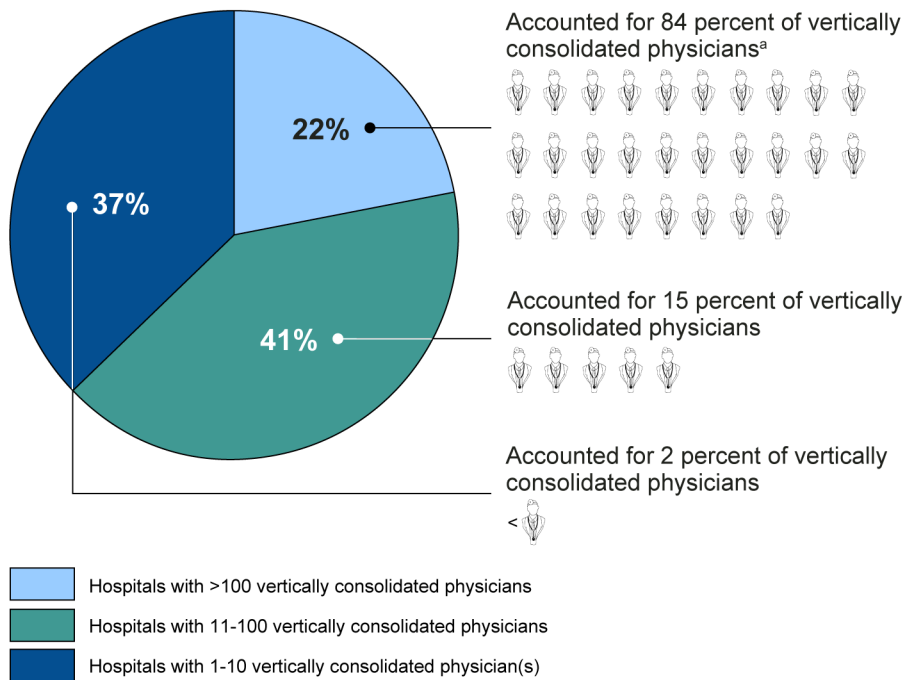


Source: GAO analysis of American Hospital Association data. | GAO-16-189

Note: We limited our analysis to hospitals that served Medicare beneficiaries on an inpatient basis based on our analysis of Medicare claims data.

Although the increase in the number of vertically consolidated physicians occurred across a broad range of hospitals from 2007 through 2013, relatively few hospitals accounted for a large number of these physicians. AHA’s survey data show that the number of vertically consolidated physicians increased across all regions of the country; in both urban and rural areas; and among hospitals of different sizes. However, relatively few hospitals accounted for a large number of vertically consolidated physicians. For example, the 372 out of 1,707 vertically consolidated hospitals that had more than 100 vertically consolidated physicians accounted for 84 percent of all vertically consolidated physicians but only 22 percent of vertically consolidated hospitals in 2013 (see fig. 2).

Figure 2: Distribution of Vertically Consolidated Hospitals and Physicians, 2013



Source: GAO analysis of American Hospital Association data. | GAO-16-189

Notes: The percentage of hospitals is based on 1,707 vertically consolidated hospitals out of the 4,689 total hospitals included in our analysis for 2013. We limited our analysis to hospitals that served Medicare beneficiaries on an inpatient basis based on our analysis of Medicare claims data.

^aPercentages may not sum to 100 due to rounding. Each physician figure represents 3 percentage points.

Researchers and industry representatives whom we interviewed offered numerous potential explanations for the recent increases in vertical consolidation.²⁰ Some stated that the trend could partially be explained by higher Medicare payment rates for services performed in HOPDs compared to other settings, the desire among some hospitals to gain market share, and changes in health care payment and delivery systems. For example, accountable care organizations, bundled payment models, and Medicare’s Hospital Readmissions Reduction Program—which

²⁰We spoke with several researchers who conducted studies on hospital-physician relationships and with industry representatives from organizations such as the AHA, American Medical Association, America’s Health Insurance Plans, and Medical Group Management Association.

penalizes hospitals for high rates of readmissions—provide incentives to vertically consolidate in order to improve care for beneficiaries, maximize payments, and minimize penalties.²¹ Researchers and industry representatives whom we interviewed also mentioned that the increasing challenges associated with managing a private physician practice, including financial and regulatory burdens, could also explain some of the increase in vertical consolidation. Some of these researchers and representatives added that hospitals and physicians may be vertically consolidating to enhance care coordination and improve efficiency.

Vertical Consolidation Associated with Higher Utilization of Medicare E/M Office Visits in Hospital Outpatient Departments

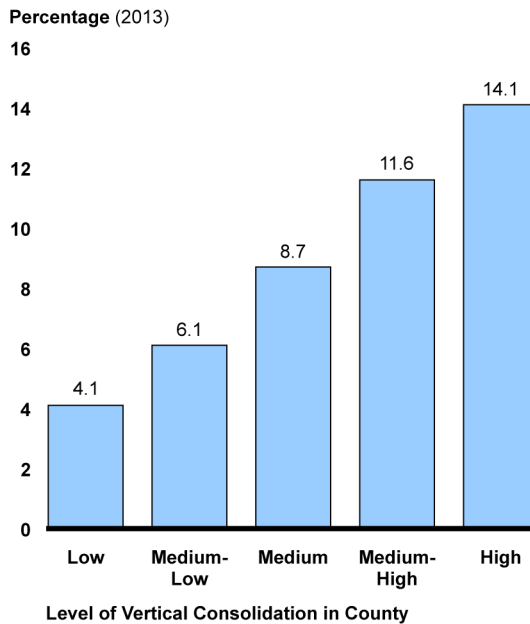
The percentage of E/M office visits—as well as the number of E/M office visits per beneficiary—performed in HOPDs, rather than physician offices, was generally higher in counties with higher levels of vertical consolidation in 2007 through 2013. The beneficiaries from counties with relatively high levels of vertical consolidation were not sicker, on average, than beneficiaries in counties with lower levels of consolidation.

Percentage of Medicare E/M Office Visits Performed in HOPDs Higher in Counties with Higher Levels of Vertical Consolidation

Our analysis of AHA and Medicare claims data shows that the percentage of E/M office visits performed in HOPDs was generally higher in counties with higher levels of vertical consolidation in 2013. Specifically, after dividing counties into five equal groups based on their 2013 level of consolidation, we found that the median percentage of E/M office visits performed in HOPDs in the group of counties with the lowest levels of vertical consolidation was 4.1 percent. In contrast, this rate was 14.1 percent for the counties with the highest levels of consolidation (see fig. 3).

²¹Accountable care organizations are groups of doctors, hospitals, and other providers who voluntarily join together with the goal of better coordinating high quality care and realizing financial savings. A bundled payment is a single payment made to providers for all services to treat a given condition or provide a given treatment. In commenting on this report, CMS officials stated that the 340B Drug Pricing Program could also provide an incentive for hospitals to acquire physician practices. This program requires drug manufacturers to provide outpatient drugs to eligible health care organizations/covered entities at significantly reduced prices.

Figure 3: Median Percentage of Medicare E/M Office Visits Performed in Hospital Outpatient Departments, by County Level of Vertical Consolidation, 2013



Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Note: Counties were sorted into quintiles based on their level of vertical consolidation in 2013. Specifically, the counties in the lowest quintile were considered to have low levels of vertical consolidation, and the next four quintiles were considered to have medium-low, medium, medium-high, and high levels of vertical consolidation, respectively.

For years 2007 to 2012, the percentage of E/M office visits performed in HOPDs was also generally higher in counties with higher levels of vertical consolidation, though the association was weaker compared to 2013. For example, the median percentage of E/M office visits performed in HOPDs in the group of counties with the lowest level of vertical consolidation was 3.9 percent in 2007, compared to a median of 7.3 percent in the counties with the highest levels of consolidation.

As part of our analysis, we also calculated the number of E/M office visits in each county on a per beneficiary basis. We found that the number of E/M office visits performed in HOPDs per 100 Medicare beneficiaries was also generally higher in counties with higher levels of vertical consolidation each year from 2007 through 2013. For example, in 2013 the number of E/M office visits performed in HOPDs per 100 beneficiaries

was 26 for the counties with low levels of vertical consolidation, whereas the number was substantially higher—82 services per 100 beneficiaries—in counties with the highest level of vertical consolidation.²² We found similar correlations in 2007 through 2012. (See app. III for additional analyses of the number of E/M office visits performed in HOPDs in counties with different levels of vertical consolidation from 2007 through 2013.)²³

The association we found between higher levels of vertical consolidation and higher utilization of E/M office visits in HOPDs remained even after controlling for differences in county-level characteristics and other market factors that could affect the setting in which E/M office visits are performed. Specifically, we developed a regression model that controlled for county characteristics that do not change over relatively short periods of time, such as whether a county is urban or rural, and county characteristics that could change over time, such as the level of competition among hospitals and physicians within counties. Our regression model's results were similar to our initial results: the level of vertical consolidation in a county was significantly and positively associated with a higher number and percentage of E/M office visits performed in HOPDs—that is, as vertical consolidation increased in a given county, the number and percentage of E/M office visits performed in HOPDs in that county also tended to be higher. (See app. I and app. II for more information on our regression model and results.)

²²While there were changes in the absolute numbers, counties with higher levels of consolidation tended to have a higher percentage and number of E/M office visits performed in HOPDs after accounting for the total volume of services and the number of beneficiaries in a county, respectively.

²³We also examined the effect of vertical consolidation on the total number of E/M office visits. For more information, see appendix IV.

Medicare Beneficiaries in Counties with Higher Levels of Vertical Consolidation Were Not Sicker Than Those in Counties with Lower Levels of Consolidation

Beneficiaries from counties with higher levels of vertical consolidation were not sicker, on average, than beneficiaries from counties with lower levels of consolidation. Specifically, beneficiaries from counties with higher levels of vertical consolidation tended to have either similar or slightly lower median risk scores, death rates, rates of end-stage renal disease, and rates of disability compared to those from counties with lower levels of consolidation (see table 2).²⁴ Further, counties with higher levels of consolidation had a lower percentage of beneficiaries dually eligible for Medicaid, who tend to be sicker and have higher Medicare spending than Medicare beneficiaries who are not dually eligible for Medicaid.²⁵ This suggests that areas with higher E/M office visit utilization in HOPDs are not composed of sicker than average beneficiaries.

Table 2: Characteristics of Medicare Beneficiaries, by County Level of Vertical Consolidation, 2013

| County Level of Vertical Consolidation | Median Risk Score | Median Age | Median Percentage That Died in Year | Median Percentage with End-Stage Renal Disease | Median Percentage Disabled | Median Percentage Dual Eligibles |
|--|-------------------|------------|-------------------------------------|--|----------------------------|----------------------------------|
| Low | 0.96 | 69.8 | 5.2% | 1.0% | 22.6% | 21.4% |
| Medium-Low | 0.95 | 70.2 | 5.2 | 0.8 | 20.1 | 16.3 |
| Medium | 0.93 | 70.7 | 5.1 | 0.7 | 18.2 | 15.0 |
| Medium-High | 0.93 | 70.7 | 5.1 | 0.7 | 18.5 | 15.4 |
| High | 0.93 | 70.3 | 5.0 | 0.7 | 19.7 | 14.9 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Counties were sorted into quintiles based on their level of vertical consolidation in 2013. Specifically, the counties in the lowest quintile were considered to have low levels of vertical consolidation, and the next four quintiles were considered to have medium-low, medium, medium-high, and high levels of vertical consolidation, respectively. A beneficiary's risk score is the ratio of expected health care expenditures for that beneficiary under Medicare fee-for-service relative to the average health care expenditures for all Medicare fee-for-service beneficiaries. End-stage renal disease is a condition of permanent kidney failure.

²⁴While the absolute numbers experienced small changes, beneficiaries from counties with higher levels of vertical consolidation tended to have either similar or slightly lower average risk scores, death rates, rates of end-stage renal disease, disability rates, and rates of dual eligibles compared to those from counties with lower levels of consolidation after weighting for the number of beneficiaries who lived in a county. A beneficiary's risk score is the ratio of expected health care expenditures for that beneficiary under Medicare FFS relative to the average health care expenditures for all Medicare FFS beneficiaries. End-stage renal disease is a condition of permanent kidney failure.

²⁵For an examination of spending by dual eligibility status, see: Congressional Budget Office, *Dual-Eligible Beneficiaries of Medicare and Medicaid: Characteristics, Health Care Spending, and Evolving Policies* (Washington, D.C.: June 2013).

As we previously stated, the extent of vertical consolidation grew from 2007 through 2013. Coinciding with that growth, we found that E/M office visits were performed more frequently in the higher paid HOPD setting in counties with higher levels of vertical consolidation. Such excess payments are inconsistent with Medicare's role as an efficient purchaser of health care services. According to CMS, the agency does not have the statutory authority to equalize total payment rates between HOPDs and physician offices. Further, CMS lacks the authority to return the associated savings to the Medicare program.²⁶ Therefore, absent legislative intervention, the Medicare program will likely pay more than necessary for E/M office visits.

Conclusions

From 2007 through 2013, the number of vertically consolidated physicians nearly doubled, with faster growth in more recent years. Regardless of what has driven hospitals and physicians to vertically consolidate, paying substantially more for the same service when performed in an HOPD rather than a physician office provides an incentive to shift services that were once performed in physician offices to HOPDs after consolidation has occurred. Our findings suggest that providers responded to this financial incentive: E/M office visits were more frequently performed in HOPDs in counties with higher levels of vertical consolidation. We found this association in both our analysis of E/M office visit utilization in counties with varying levels of vertical consolidation and in our regression analyses. Further, our analysis of 2013 health status data suggests that beneficiaries from counties with higher levels of vertical consolidation, where we found more E/M office visits performed in HOPDs, were not sicker, on average, than beneficiaries who lived in counties with lower levels of consolidation, where we found fewer E/M office visits performed in HOPDs.

While vertical consolidation has potential benefits, we found that the rise in vertical consolidation exacerbates a financial vulnerability in Medicare's

²⁶The Secretary of HHS is required to annually revise the groups, relative payment weights, and the wage and other adjustments to the hospital outpatient services that are paid under the OPSS to take into account changes in medical practice, changes in technology, the addition of services, new cost data, and other relevant information and factors. However, any such adjustments must be offset by adjustments in other relative weights in a budget neutral manner. Social Security Act § 1833(t)(9)(A), (B). Because of this budget neutrality requirement, Medicare would not realize savings resulting from such revisions, in that forgone payments would not be returned to the Medicare program.

payment policy: Medicare pays different rates for the same service, depending on where the service is performed. Although Medicare aims to be an efficient purchaser of health care services, CMS has stated that the agency currently lacks the authority to equalize payment rates between settings. Further, CMS lacks the authority to return the associated savings to the Medicare program. Until the disparity in payment rates for E/M office visits is addressed, Medicare could be expending more resources than is necessary.

Matter for Congressional Consideration

In order to prevent the shift of services from physician offices to HOPDs from increasing costs for the Medicare program and beneficiaries, Congress should consider directing the Secretary of HHS to equalize payment rates between settings for E/M office visits—and other services that the Secretary deems appropriate—and to return the associated savings to the Medicare program.

Agency and Third-Party Comments and Our Evaluation

HHS provided technical comments on a draft of this report, which we incorporated where appropriate. In addition, we provided two organizations—the American Medical Association and AHA—the opportunity to review our draft because these organizations represent the types of providers and care settings that were the main focus of our report. The American Medical Association had no comments. AHA did not comment on the main finding of our report—that higher levels of vertical consolidation were associated with more E/M office visits being performed in HOPDs instead of physician offices. Further, AHA noted several reasons why, in their opinion, a service performed in an HOPD should receive a higher Medicare reimbursement compared to when the same service is performed in other settings. AHA did comment on two specific aspects of our report—our characterization of beneficiary health status and reasons why vertical consolidation occurs. A summary of these comments and our response are below.

AHA gave several reasons why a service performed in an HOPD should receive a higher Medicare reimbursement compared to when the same service is performed in other settings, such as physician offices. For example, AHA commented that HOPD payment rates are based on audited cost reports and should not be based on physician payment rates. We acknowledge that it might be inappropriate to equalize the total Medicare payment rate for all services. However, Medicare aims to be a prudent purchaser of health care services, and that goal is not achieved if Medicare's total payment rate for certain services—such as E/M office

visits—is substantially higher simply because hospitals have acquired physician practices. Other entities such as MedPAC have also suggested that Medicare base its payments for services on the lowest cost, clinically appropriate setting.

AHA stated that it disagreed with what it interpreted our report to show—that overall, patients treated at HOPDs are not sicker than those treated at physician offices. Our report does not make such an assertion, but does include our finding that beneficiaries residing in counties with higher levels of vertical consolidation were not sicker, on average, than beneficiaries residing in counties with lower levels of consolidation. Given that counties with higher levels of vertical consolidation had more E/M office visits performed in HOPDs, our evidence suggests that areas with higher E/M office visit utilization in HOPDs were not composed of sicker than average beneficiaries.

AHA commented that vertical integration—what our report terms vertical consolidation—is an essential ingredient for successful implementation of the Patient Protection and Affordable Care Act and that we failed to adequately account for reasons other than payment differentials that drive vertical consolidation. Our report notes multiple reasons, identified by the researchers and industry experts we interviewed, as to why hospitals and physicians might vertically consolidate. These potential reasons include certain payment and delivery changes associated with the Patient Protection and Affordable Care Act. While we identified multiple factors that may be contributing to increases in vertical consolidation, a full analysis of the causes or the appropriateness of vertical consolidation between hospitals and physicians was outside the scope of our work.

We are sending copies of this report to the appropriate congressional committees, the Secretary of HHS, and the CMS administrator. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at (202) 512-7114 or cosgrovej@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix V.

A handwritten signature in black ink, appearing to read "James Cosgrove". The signature is stylized with large, sweeping loops and a cursive script.

James Cosgrove
Director, Health Care

List of Requesters

The Honorable Orrin Hatch
Chairman

The Honorable Ron Wyden
Ranking Member
Committee on Finance
United States Senate

The Honorable Mike Enzi
Chairman
Subcommittee on Primary Health and Retirement Security
Committee on Health, Education, Labor and Pensions
United States Senate

The Honorable Jim McDermott
Ranking Member
Subcommittee on Health
Committee on Ways and Means
House of Representatives

Appendix I: Scope and Methodology

This appendix describes the scope and methodology used to examine our two objectives: (1) trends in vertical consolidation between physicians and hospitals from 2007 through 2013 and (2) the extent to which higher levels of vertical consolidation were associated with more evaluation & management (E/M) office visits being performed in hospital outpatient departments (HOPD) instead of physician offices from 2007 through 2013.

Examining Trends in Vertical Consolidation between Hospitals and Physicians

To examine trends in vertical consolidation between hospitals and physicians, we used survey data from the American Hospital Association (AHA) Annual Survey Database,TM in which hospitals report what types of relationships they have with physicians and the number of physicians in those relationships, and Medicare Provider Analysis and Review (MedPAR) files, which contain information on Medicare inpatient discharges for short-term acute care hospitals, from 2007 through 2013. First, we used MedPAR data to identify hospitals that served at least one Medicare beneficiary from 2007 through 2013. We then took that list of hospitals—which are identified using their Centers for Medicare & Medicaid Services Certification Number—and, using the AHA Annual Survey Database,TM determined whether each hospital was vertically consolidated with physicians in each year from 2007 through 2013. Similar to previous research on vertical consolidation, we considered a hospital to be vertically consolidated if it had one of three types of relationships with physicians—an integrated salary, foundation, or equity model. (See table 3 for a description of these three arrangements.)

Table 3: Select Types of Hospital-Physician Arrangements Reported in AHA Annual Survey DatabaseTM

| Type of relationship | Description |
|-------------------------|---|
| Integrated salary model | Physicians are salaried by the hospital or another entity of a health system to provide medical services for primary care and specialty care. |
| Equity model | A professional corporation that allows established practitioners to become shareholders in exchange for the tangible and intangible assets of their existing practices. |
| Foundation | A corporation, organized either as a hospital affiliate or subsidiary, which purchases both the tangible and intangible assets of one or more medical group practices. Physicians remain in a separate corporate entity but sign a professional services agreement with the foundation. |

Source: GAO summary of American Hospital Association data documentation. | GAO-16-189

To identify the number of vertically consolidated hospitals, we counted the number of hospitals with any one of these three types of relationships. To identify the number of vertically consolidated physicians, we implemented edits to modify reported counts of vertically consolidated physicians that

we believed were likely duplicative and then summed the number of physicians. We identified duplicative survey responses as those where hospitals reported more than 10 vertically consolidated physicians and also reported the same number of vertically consolidated physicians as another hospital in the same hospital system.¹ In such instances, we assumed that the total number of vertically consolidated physicians associated with a hospital system was reported multiple times by more than one hospital.

Additionally, based on a review of pertinent literature, we identified and interviewed industry representatives and academic researchers. To better understand hospitals' perspectives on vertical consolidation, we interviewed officials from AHA. Similarly for physicians, we interviewed the American Medical Association and Medical Group Management Association. We also interviewed numerous academic researchers to better understand issues such as the various types of hospital-physician relationships, possible data sources to track vertical consolidation, and health care system policies that could be driving consolidation.

Examining the Extent to Which Higher Levels of Vertical Consolidation Were Associated with More E/M Office Visits Being Performed in Hospital Outpatient Departments

¹We did not identify hospitals as potentially reporting duplicative counts of vertically consolidated physicians if they reported 10 or fewer physicians because 1) a very small percentage of the overall number of vertically consolidated physicians were associated with hospitals with 10 or fewer physicians and 2) we believed that the chances of two hospitals in the same system coincidentally having the same number of vertically consolidated physicians increased as the number of vertically consolidated physicians per hospital decreased.

Bivariate Analyses and
Variable Construction

To attribute E/M office visits to a given county, we used the beneficiary county of residence that was listed on the Carrier and Outpatient file claims.² To determine the total number of E/M office visits that were performed in a given county, we combined the number of E/M office visits from the Carrier file and the number of E/M office visits associated with professional claims in the Medicare Outpatient file.³ To determine the number of E/M office visits performed in HOPDs in a given county, we summed the number of services billed in the Medicare Outpatient file, including services provided by critical access hospitals.⁴ The number of E/M office visits performed in physician offices was calculated by subtracting the number of HOPD services from the total number of services.⁵ To calculate the number of services per Medicare beneficiary in a given county, we used the Medicare Denominator file to identify fee-for-service (FFS) beneficiaries.⁶

²We defined E/M office visits as HCPCS codes 99201-99215. For the purposes of this study, we did not differentiate based on the intensity of E/M office visits.

³We considered an Outpatient file service a professional service if the bill type was 85x and the revenue center was 096x, 097x, or 098x. For more information on this, see the Medicare Claims Processing Manual, Chapter 4.

⁴Specifically, we analyzed claims with a type of bill 13x or 85x and excluded professional claims. As a sensitivity analysis, we determined the number of HOPD services using the place of service code on Carrier claims. This specification tended to indicate that a slightly lower percentage of services were performed in HOPDs. In 2013, for example, we found that 10.1 percent of E/M office visits were performed in HOPDs using the place of service variable, compared to 11.1 percent using Outpatient file claims. However, when we tested this alternative specification, counties with higher levels of consolidation still had higher HOPD utilization. In 2013, for example, the counties in the bottom quintile in terms of vertical consolidation had a median of 4.5 percent of office visits performed in HOPDs compared to 12.9 percent for the counties in the highest quintiles. This range is similar to the one we found using our Outpatient file claims as the numerator of the percentage—4.1 percent to 14.1 percent.

⁵We classified all services not performed in HOPDs as being performed in a physician office, as less than 2 percent of E/M office visits were performed in settings other than an HOPD or physician office during our study period.

⁶The Medicare Denominator file contains demographic and enrollment information about Medicare beneficiaries.

To calculate the level of vertical consolidation in each county, we used the AHA Annual Survey DatabaseTM and MedPAR claims.⁷ First, we calculated the share of MedPAR services that were delivered by vertically consolidated hospitals in each zip code in which a beneficiary received at least one service.⁸ We then created a weighted average hospital level vertical consolidation measure using all the zip codes a hospital served in a year. Finally, we created a weighted average county level vertical consolidation measure based on the hospitals that served each county.⁹ To calculate control variables for our regression analyses, we used a similar process. Specifically, we calculated variables for profit status, public vs. private ownership, hospital size, teaching status, whether a hospital belonged to a system, and Herfindahl-Hirschman Indexes (HHI) for hospital and physician market concentration.¹⁰

To determine how the level of vertical consolidation in a county was associated with the setting in which E/M office visits were provided before controlling for other factors, we conducted a bivariate analysis for every year from 2007 through 2013. Specifically, we ranked counties into quintiles based on the level of consolidation in each county in 2013. In the bottom quintile were the 20 percent of counties with the lowest levels of

⁷Because we did not know the markets of the vertically consolidated physicians, we used the MedPAR markets of the hospitals with whom they are consolidated as a proxy. As a sensitivity analysis, we used HOPD markets as a proxy, as those markets could better proxy physician markets. When we used HOPD markets instead of the MedPAR markets, counties with higher levels of consolidation still had higher HOPD utilization. In 2013, for example, the counties in the bottom quintile had a median of 5.4 percent of E/M office visits performed in HOPDs compared to 14.8 percent for the counties in the highest quintile. This range is similar to the one we found using MedPAR data—4.1 percent to 14.1 percent.

⁸For this analysis, we considered a hospital to be vertically consolidated if it had more than 10 vertically consolidated physicians. This prevented hospitals that had a very small number of vertically consolidated physicians as counting the same as hospitals with significantly more physicians.

⁹For each county, this variable is between 0 and 1; a value of 1 represents a county that is served entirely by hospitals whose entire market area—that is, zip codes of the beneficiaries served by the hospital—is served by vertically consolidated hospitals and a value of 0 represents a county that is served entirely by hospitals whose entire market areas are served by hospitals that are not vertically consolidated.

¹⁰For the purposes of creating our measure of horizontal hospital concentration, we considered all hospitals that were part of the same system to be part of the same hospital because we assumed that hospitals that are part of the same system do not compete with one another in the same manner as hospitals that are not part of the same system.

vertical consolidation; such counties were considered to have low levels of vertical consolidation. In order, the next four quintiles were considered to have medium-low, medium, medium-high, and high levels of vertical consolidation. For 2007 through 2012, we used the same thresholds to sort counties into the five levels of consolidation. Within each of the five county groups for each year, we then calculated the 1) median and mean percentage of E/M office visits that were performed in HOPDs and physician offices and 2) the median and mean number of E/M office visits per beneficiary performed in HOPDs, physician offices, and in total.

To determine whether counties with higher levels of vertical consolidation had sicker or healthier beneficiaries, we calculated descriptive statistics for beneficiaries who lived in a given county in 2013 using the Medicare denominator file.¹¹ Specifically, for each county, we calculated the mean and median risk score, age, and the percentage of beneficiaries that died, had end-stage renal disease, were disabled, and were dually eligible for Medicare and Medicaid.¹² Similar to the bivariate analysis described above, we then ranked counties into quintiles based on the level of vertical consolidation in 2013. Within the quintiles, we calculated the median and mean values for each of the variables.

Panel-Data Regression Model

We developed an econometric model to analyze the effect of vertical consolidation on the setting where beneficiaries received E/M office visits from 2007 through 2013. Specifically, we analyzed how the level of vertical consolidation affected 1) the percentage of E/M office visits performed in HOPDs, 2) the number of E/M office visits performed in HOPDs per beneficiary, and 3) the total number of E/M office visits per beneficiary. Our analysis used data for 3,121 U.S. counties from 2007 through 2013.

Dependent Variables

- For the model analyzing the percentage of E/M office visits performed in HOPDs, we used the log-odds transformation (also called the logit

¹¹We limited these calculations to only Medicare FFS beneficiaries. These beneficiaries can receive services outside of their county of residence. With the exception of the death rate, all characteristics were weighted based on the number of months a beneficiary was enrolled in Medicare. Weighting the death rate by the number of months beneficiaries were enrolled in Medicare artificially deflates the death rate.

¹²When calculating the risk score, we excluded beneficiaries that were newly enrolled, enrolled in Medicare Advantage, had end-stage renal disease, or were in a long term care facility. The risk score used was normalized and adjusted for coding intensity.

transformation) of this proportion. Specifically, we used the following formula for this dependent variable:

$$Y_{it} = \log(r_{it}/(1 - r_{it}))$$

Where r_{it} represents the proportion of E/M office visits that were provided in an HOPD, and the i and t subscripts represent the county and year, respectively.¹³ This formulation has the advantage of allowing the dependent variable to range over all values for any value of r between zero and one.¹⁴

Explanatory Variables

- For our models analyzing the number of E/M office visits performed in HOPDs per beneficiary and the total number of E/M office visits per beneficiary, our dependent variables were the logarithm of the number of services per beneficiary.
- Our key explanatory variable was the level of vertical consolidation. Our hypothesis was that higher levels of vertical consolidation would be associated with a higher percentage and number of E/M office visits being performed in HOPDs.
- Our model controlled for horizontal physician and horizontal hospital concentration, using HHIs. We hypothesized that greater concentration of market power among physicians would lead to E/M office visits being provided in physician offices rather than HOPDs, all else being equal. In contrast, we hypothesized that greater concentration of market power among hospitals would lead to E/M office visits being provided in HOPDs rather than physician offices, all else being equal.
- Our model included hospital characteristic variables to account for possible differences in hospital size and institutional arrangements. Specifically, our model included variables for the following hospital characteristics: profit status, public vs. private ownership, hospital

¹³We also ran a model using the proportion r_{it} , and the results for our main variable of interest, vertical consolidation, were similar in terms of sign and significance.

¹⁴This transformation required that the value of r_{it} be strictly greater than 0 and less than 1. Although there were no observations with a value of 0, about 0.5 percent of our observations were equal to or exceeded 1. For any value equal to or greater than 1, we changed the value to 0.9999 for the model estimation. To ensure that the small number of values that were transformed did not unduly affect our results, we also ran the model excluding these observations.

Model Specification

size, teaching status, and whether a hospital belonged to a system.

- Our model included time fixed effects (a dummy variable for each year in the analysis). In addition, we included county fixed effects (a dummy variable for each of the 3,121 counties in the analysis). These county fixed effects assist in controlling for unobserved heterogeneity.

The regression analysis used a panel data model for 3,121 U.S. counties for the years 2007 through 2013 as follows:

$$Y_{it} = \sum_i c_i + \sum_t f_t + \sum_h \alpha_h Z_{it}^h + \varepsilon_{it}$$

In this model:

- Y_{it} is the dependent variable for county i in year t . For the model analyzing the percentage of E/M office visits performed in HOPDs, the dependent variable is the logit transformation of the percentage of services in an HOPD setting—that is, $Y_{it} = \log(r_{it}/(1 - r_{it}))$, where r_{it} is the percentage of E/M office visits in an HOPD. For our models analyzing the number of E/M office visits performed in HOPDs per beneficiary and the total number of E/M office visits per beneficiary, $Y_{it} = \log(s_{it})$, where s_{it} is the number of services per Medicare beneficiary.
- c_i is a fixed effect or dummy variable for county i .
- f_t is a fixed effect or dummy variable for year t .
- Z_{it}^h are the hospital-characteristic variables and market structure variables, such as horizontal physician HHI, horizontal hospital HHI, and vertical consolidation, associated with county i at time t , and α_h are the parameters associated with each of these variables.
- ε_{it} are the error terms.
- We used `xtivreg2` in STATA to estimate our models.¹⁵ Our parameter estimates are consistent given the assumptions of our model. Our

¹⁵The `xtivreg2` procedure in STATA implements Instrumental Variable/General Method of Moments estimation of the fixed-effects and first-differences panel data models with possibly endogenous regressors.

standard errors are robust to heteroskedasticity and clustering at the county level.

- The hospital characteristics, the horizontal hospital HHI, and the vertical consolidation measures were calculated using MedPAR data, while the dependent variable was calculated using Outpatient and Carrier file data. This separation reduced the likelihood that these market characteristics were correlated with unobserved determinants of the setting where beneficiaries received E/M office visits. However, the physician HHI measure was calculated using Carrier file data, so we tested this variable for endogeneity.¹⁶

Limitations

Our study has some limitations. While the response rate for the AHA Annual Survey DatabaseTM was high for each year—about 76 percent—the data on vertical consolidation was self-reported by hospitals. In the process of examining the AHA Annual Survey Database,TM we identified responses that we believe were likely duplicative. However, our ability to identify and fix duplicative responses is limited because we were not able to directly contact survey respondents based on our data licensing agreement. Second, because the AHA Annual Survey DatabaseTM does not contain identifying information for vertically consolidated physicians, we used hospital inpatient markets to proxy vertically consolidated physician markets. Although this is a limitation, we conducted a sensitivity analysis with HOPD markets, and our results held. Further, we believe there are several reasons why vertically consolidated physician markets should substantially overlap with hospital inpatient markets. For example, physician practices generally must be located within 35 miles of its parent hospital to bill as an HOPD, and many payment reforms—such as accountable care organizations, bundled payments, and Medicare’s Hospital Readmissions Reduction Program—reward hospitals for managing their patients across inpatient and outpatient settings. Third, vertically consolidated hospitals varied widely in terms of the number of vertically consolidated physicians associated with them. While our bivariate and regression analyses only consider a hospital vertically

¹⁶Other work on the effects of market concentration on prices has instrumented the key concentration measures, see, for example, W. N. Evans et al. “Endogeneity in the Concentration-Price Relationship: Causes, Consequences, and Cures.” *The Journal of Industrial Economics*, vol. XLI, no. 4, December 1993. However, our work focused on modeling the setting where beneficiaries received services and utilization, not price. Although work by Baker et al. analyzing prices did not use instrumental variables, we wanted to test for the possibility that there was endogeneity of the horizontal physician HHI variable.

consolidated if it has more than 10 vertically consolidated physicians, we were unable to make our measure of vertical consolidation reflect the intensity of vertical consolidation relationships—that is, the number of vertically consolidated physicians per hospital—because of data limitations. Finally, time lags may occur between vertical consolidation and our measures of how often E/M office visits are performed in an HOPD. A hospital can purchase physician practices and not convert them to HOPDs immediately or ever. Consequently, these lags may be long and variable, and we have no systematic data to measure the timing of these possible effects.

Data Reliability and Audit Standards

We took several steps to ensure that the data used to produce this report were sufficiently reliable. Specifically, we assessed the reliability of the Centers for Medicare & Medicaid Services data and the AHA Annual Survey Database™ we used by interviewing officials responsible for overseeing these data sources. We also reviewed relevant documentation and examined the data for obvious errors, such as missing values and values outside of expected ranges. We determined that the data were sufficiently reliable for the purposes of this report.

We conducted this performance audit from February 2014 through December 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Full Regression Results

This appendix provides more detailed results for the models we used to analyze the effect of vertical consolidation on the setting where beneficiaries received E/M office visits from 2007 through 2013.

- Counties with higher levels of vertical consolidation were significantly more likely to have a higher proportion of their E/M office visits performed in HOPDs. These counties also had a significantly higher rate of utilization of E/M office visits in HOPDs. However, those same counties also had a significantly lower rate of overall utilization of E/M office visits, although the size of this negative association was smaller.¹ Specifically, all else being equal, our models predict that a county with no vertical consolidation going to completely consolidated would experience:
 - an increase in the percent of E/M office visits performed in HOPDs of 2.7 percentage points on average;
 - an increase in the number of E/M office visits per beneficiary being performed in HOPDs of approximately 30 percent on average; and
 - a decrease in the total number of E/M office visits per beneficiary of less than 2 percent on average.
- We used a set of medical service supply variables from the Area Health Resource Files as instruments: the number of federal and non-federal active MDs as a percentage of the total population, total hospital beds per capita, and whether the area was designated as a health care professional shortage area for primary care physicians.²

¹In order to conduct additional sensitivity analyses, we examined alternative specifications for our models. First, we replaced the logit transformation in our model that analyzed the percentage of E/M office visits performed in HOPDs with a simple percent of E/M office visits in an HOPD and found similar results for vertical consolidation. Secondly, we estimated our utilization per beneficiary equations using levels rather than logs and found similar results in terms of sign and significance on the main variable of interest—namely, the vertical hospital consolidation measure.

²Area Health Resources Files (AHRF) contain county, state, and national level data on a broad range of health resources and socioeconomic indicators which impact demand for health care. The AHRF provides current as well as historic data for more than 6,000 variables for each of the nation's counties and contains information on health facilities, health professions, measures of resource scarcity, health status, economic activity, health training programs, and socioeconomic and environmental characteristics.

- In our models of the percentage of E/M office visits performed in HOPDs and total number of E/M office visits per beneficiary, the C-test accepted the null hypothesis of exogeneity of the physician horizontal Herfindahl-Hirschman Index (HHI) variable, and the Hansen J-statistic accepted the null hypothesis that our instruments were valid. The Sanderson-Windmeijer test also supported our use of these instruments, by rejecting the null hypothesis of weak instruments.
- In our model of the number of E/M office visits performed in HOPDs, the Hansen J-statistic accepted the null hypothesis that our instruments were valid, and the Sanderson-Windmeijer test rejected the null hypothesis of weak instruments. However, the C-test rejected the null hypothesis of exogeneity of the physician horizontal HHI variable, so we report our instrumental variable estimates for our log of utilization of E/M office visits performed in HOPDs.
- A full set of results is provided in table 4.

Table 4: Regression Estimation Results for U.S. Counties, 2007 through 2013

| | Ordinary least squares estimate of logit of percent HOPD | Instrumental variable estimate of log of per beneficiary utilization in HOPD | Ordinary least squares estimate of log of per beneficiary utilization overall |
|---|--|--|---|
| Vertical consolidation | 0.311*** (0.0000) | 0.304** (0.0016) | -0.0179* (0.0106) |
| Physician horizontal Herfindahl-Hirschman Index (HHI) | -4.538*** (0.0000) | -13.48 (0.1117) | 0.735*** (0.0000) |
| Hospital horizontal HHI | 0.426 (0.1534) | 0.838 (0.0548) | 0.0229 (0.4897) |
| For-profit hospitals | -0.408*** (0.0001) | -0.241* (0.0348) | -0.0297 (0.0612) |
| Public ownership hospitals | 0.580*** (0.0000) | 0.652*** (0.0002) | -0.0232 (0.1824) |
| Hospitals with 100 to 300 beds | -0.626*** (0.0002) | -0.420** (0.0013) | 0.0260 (0.0938) |
| Hospitals with more than 300 beds | -0.587*** (0.0004) | -0.263* (0.0392) | 0.0195 (0.2525) |
| Teaching hospitals | -0.0267 | -0.00288 | -0.0126 |

Appendix II: Full Regression Results

| | Ordinary least squares estimate of logit of percent HOPD | Instrumental variable estimate of log of per beneficiary utilization in HOPD | Ordinary least squares estimate of log of per beneficiary utilization overall |
|------------------|--|--|---|
| | (0.6930) | (0.9672) | (0.1986) |
| System hospitals | 0.151 (0.0764) | 0.0459 (0.4344) | 0.0194* (0.0216) |
| 2007 dummy | -0.535*** (0.0000) | -0.473*** (0.0000) | -0.0744*** (0.0000) |
| 2008 dummy | -0.445*** (0.0000) | -0.390*** (0.0000) | -0.0762*** (0.0000) |
| 2009 dummy | -0.354*** (0.0000) | -0.307*** (0.0000) | -0.0621*** (0.0000) |
| 2010 dummy | -0.378*** (0.0000) | -0.318*** (0.0000) | 0.00573** (0.0014) |
| 2011 dummy | -0.254*** (0.0000) | -0.203*** (0.0000) | -0.00988*** (0.0000) |
| 2012 dummy | -0.105*** (0.0000) | -0.0840*** (0.0000) | -0.0150*** (0.0000) |
| Observations | 21,847 | 21,847 | 21,847 |

p-values in parentheses - * p<0.05, ** p<0.01, * p<0.001**

Source: GAO analysis of Centers for Medicare & Medicaid Services data, Area Health Resources Files, and American Hospital Association data. | GAO-16-189

Appendix III: Evaluation & Management Office Visit Utilization by Level of Vertical Consolidation, 2007 through 2013

The percentage of E/M office visits—as well as the number of E/M office visits per 100 beneficiaries—performed in HOPDs was generally higher in counties with higher levels of vertical consolidation from 2007 through 2013 (see tables 5 - 11).

Table 5: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2007

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|---------------------------------|---|---|--|
| Low | 3.9% | 22 | 599 |
| Medium-Low | 5.9 | 30 | 547 |
| Medium | 6.2 | 31 | 534 |
| Medium-High | 7.9 | 38 | 545 |
| High | 7.3 | 39 | 580 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

Table 6: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2008

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|---------------------------------|---|---|--|
| Low | 3.7% | 21 | 608 |
| Medium-Low | 6.2 | 33 | 556 |
| Medium | 7.2 | 36 | 532 |
| Medium-High | 9.8 | 45 | 528 |
| High | 8.2 | 43 | 582 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

**Appendix III: Evaluation & Management Office
Visit Utilization by Level of Vertical
Consolidation, 2007 through 2013**

Table 7: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2009

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|--|--|--|---|
| Low | 3.8% | 22 | 614 |
| Medium-Low | 6.7 | 35 | 572 |
| Medium | 7.0 | 37 | 545 |
| Medium-High | 8.9 | 45 | 537 |
| High | 8.4 | 46 | 577 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

Table 8: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2010

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|--|--|--|---|
| Low | 3.8% | 23 | 644 |
| Medium-Low | 5.9 | 34 | 610 |
| Medium | 7.5 | 42 | 573 |
| Medium-High | 7.3 | 41 | 588 |
| High | 8.5 | 52 | 620 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

Appendix III: Evaluation & Management Office
 Visit Utilization by Level of Vertical
 Consolidation, 2007 through 2013

Table 9: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2011

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|---------------------------------|---|---|--|
| Low | 3.8% | 23 | 641 |
| Medium-Low | 6.2 | 36 | 607 |
| Medium | 8.3 | 46 | 564 |
| Medium-High | 7.9 | 49 | 599 |
| High | 9.8 | 57 | 600 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

Table 10: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2012

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|---------------------------------|---|---|--|
| Low | 4.1% | 24 | 636 |
| Medium-Low | 6.6 | 38 | 610 |
| Medium | 8.9 | 49 | 572 |
| Medium-High | 9.7 | 56 | 582 |
| High | 11.8 | 66 | 600 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

Table 11: Utilization of E/M Office Visits in Total and in HOPDs, by County Level of Vertical Consolidation, 2013

| Level of Vertical Consolidation | Median Percentage of E/M Office Visits Performed in HOPDs | Median Number of E/M Office Visits Performed in HOPDs per 100 Beneficiaries | Median Number of Total E/M Office Visits per 100 Beneficiaries |
|---------------------------------|---|---|--|
| Low | 4.1% | 26 | 658 |
| Medium-Low | 6.1 | 37 | 622 |
| Medium | 8.7 | 49 | 580 |
| Medium-High | 11.6 | 65 | 586 |
| High | 14.1 | 82 | 601 |

Source: GAO analysis of Centers for Medicare & Medicaid Services and American Hospital Association data. | GAO-16-189

Notes: Evaluation & management (E/M), hospital outpatient department (HOPD).

Appendix IV: Association between Vertical Consolidation and Overall Utilization of Evaluation & Management Office Visits across All Settings

To examine whether vertical consolidation affected total utilization, we examined the association between vertical consolidation in a county and the total number of evaluation & management (E/M) office visits per beneficiary and found mixed results. Specifically, while counties with the lowest level of vertical consolidation had higher total utilization of E/M office visits compared to counties with the highest levels of vertical consolidation, total utilization of E/M office visits neither increases nor decreases consistently as the level of vertical consolidation increases in a county in our bivariate analysis. For example, in 2013, the median number of total E/M office visits per 100 beneficiaries decreased from 658 among the counties with the lowest levels of vertical consolidation to 580 among counties with a medium level of vertical consolidation; however, among counties with high levels of vertical consolidation, the number increased to 601.¹ Furthermore, unlike our results examining the setting in which E/M office visits were performed, our results changed when we tested an alternative measure of vertical consolidation.² For example, using the alternative specification, the median number of total E/M office visits per 100 beneficiaries in counties with the highest level of vertical consolidation was at least 10 services per 100 beneficiaries higher than in counties with the lowest level of consolidation in 4 out of 7 years from 2007 through 2013.

¹We found similar patterns in each year from 2007 through 2012. We also tested the association between vertical consolidation and total volume of E/M office visits using a regression based analysis and found a small, significant association. See appendix II for more detailed results.

²Because we did not know the markets of the vertically consolidated physicians, we used the MedPAR markets of the hospitals with whom they are consolidated as a proxy. As a sensitivity analysis, we used HOPD markets as a proxy, as those markets can better proxy physician markets.

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

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