CHAPTER 6

# Mandated report: Assessment of the Medicare Ground Ambulance Data Collection System

## RECOMMENDATION

**6** The Congress should direct the Secretary to continue collecting cost and revenue data from suppliers and providers of ground ambulance services.

- Data collection should focus on information essential to assessing both the accuracy of Medicare payments and Medicare beneficiaries' access to care; and
- The Secretary should pursue opportunities to streamline data collection to minimize burden on suppliers and providers.

**COMMISSIONER VOTES: YES 14 • NO 0 • NOT VOTING 1 • ABSENT 2**

CHAPTER 6

# Mandated report: Assessment of the Medicare Ground Ambulance Data Collection System

## Chapter summary

Since 2002, Medicare has paid for ground ambulance services provided to fee-for-service (FFS) Medicare beneficiaries using the ambulance fee schedule (AFS). Medicare makes a single payment for the transport to the nearest appropriate facility, including necessary items and services. Payments under the AFS have two components: one for the service itself and one for mileage. The payment for the service reflects the intensity of the transport, adjusted for geographic differences in costs. It is calculated using a relative-value unit (RVU), a conversion factor, a geographic adjustment, and an add-on payment depending on whether the transport begins in an urban, rural, or super-rural area. ("Super-rural" areas are ZIP codes located in rural counties that are in the lowest quartile of all rural counties by population density.) The payment for the mileage component reflects the distance traveled with the patient and is adjusted with add-on payments that differ depending on whether the transport begins in an urban or rural area.

The RVUs and add-on payments in the AFS generally were not based on cost data and have remained largely unchanged since they were implemented. In 2013, in response to a congressional mandate, the Commission examined the use of ambulance services under Medicare's AFS as well as other information and found evidence that suggested

## In this chapter

- The ambulance payment system was largely developed without cost data
- Accurate cost data needed to assess payment accuracy and access to care
- GADCS dataset allows for effective analysis of ambulance costs and payments, but it needs refinement
- Stakeholders support continued collection of a more streamlined dataset
- Substantial variation among ground ambulance organizations in services provided and costs
- CMS should continue to collect GADCS data, streamlined to reduce burden

that AFS payments might not accurately reflect variation in costs. However, no cost data were available to comprehensively assess the overall adequacy of ambulance payments or their accuracy across patient severity levels or geographic locations. Without cost data, policymakers must rely on indirect measures of payment adequacy to determine whether Medicare's payments to ambulance organizations are adequate to ensure beneficiary access to care. Further, the extent to which payments under the AFS align with the costs to efficiently provide ground ambulance services to beneficiaries with different needs in different locations cannot be determined.

To support analysis of whether the AFS payments are appropriate, the Congress directed CMS—via the Bipartisan Budget Act (BBA) of 2018—to implement the Medicare Ground Ambulance Data Collection System (GADCS). CMS collected data for 2022 and 2023 from a sample of ambulance organizations, including information on organization characteristics, service area, service volume, response times, staffing and service mix, and certain categories of costs and revenues over a 12-month period. The BBA of 2018 also directed MedPAC to assess and analyze the GADCS data and report on geographic variation in the cost of furnishing ambulance services and the adequacy of Medicare's payments under the AFS. In addition, the Commission is required to assess the burden on ambulance organizations of reporting the data and recommend whether CMS should continue the data-collection effort or revise it.

The GADCS contains a rich set of variables. The data are sufficient to allow policymakers to assess the appropriateness of the AFS payment adjustments (RVUs; urban, rural, or super rural; and geographic areas). Although the GADCS cost data reflect the costs of providing ambulance services for all patients and do not separately estimate the costs specifically associated with providing services to FFS Medicare patients, our analysis suggests that the cost of serving FFS Medicare beneficiaries generally is similar to the cost of serving all other patients. Therefore, the GADCS cost data are useful in assessing FFS Medicare's payments.

However, measures of ambulance organizations' revenues relative to costs (such as financial margins) should be viewed cautiously. The GADCS collection effort marked the first time that most ambulance organizations submitted cost and revenue data, so there are likely reporting errors across the data elements. CMS has expressed particular concern that organizations may have made errors reporting revenue from sources, such as local government funding,

that are unrelated to billing for ground ambulance services. These reporting errors are especially relevant for government-owned organizations because 52 percent of the overall revenue reported by these organizations stemmed from such sources. Reporting errors may underlie the extremely large differences between revenues and costs that we found for some organizations. These data issues suggest that GADCS-based measures of revenues relative to costs might not be reliable indicators of payment adequacy at this time.

With this caveat in mind, we used the GADCS data to calculate revenue-to-cost ratios (RCRs) for ambulance organizations. We found that low-volume organizations had much lower RCRs than high-volume organizations. In addition, urban organizations had higher RCRs than rural organizations, and for-profit organizations had higher RCRs than nonprofit and government organizations. However, RCRs varied widely within each of these categories, with RCRs for some organizations indicating that revenues were well below costs, while revenue was well above costs for other organizations.

We found that the strongest driver of ground ambulance cost per transport was the volume of transports that an organization provides. As the number of transports increased, costs grew at a much lower rate, which suggests economies of scale. In addition, we found that cost per transport was lower for for-profit organizations relative to nonprofit and government-owned organizations. Cost per transport was also lower for organizations that used a dynamic staffing model (meaning the number of fully staffed ambulance units varies by day, time, or season) compared with those that used a static staffing model (meaning the same number of fully staffed ambulance units is available at all times). Finally, regression results suggested that, when controlling for other factors that affect costs (such as volume of transports), organizations with rural service areas had lower cost per transport than organizations with urban service areas. In other words, if a rural organization and urban organization were otherwise the same—including providing the same number of transports—the organization with a rural service area tended to have lower costs. However, rural organizations were more likely to be low volume and isolated than urban organizations. Hence, rural organizations would be more likely to benefit from payment adjustments targeted to low-volume organizations that serve isolated areas.

The GADCS includes over 600 variables (though organizations often were not required to address all the questions, due to the structure of the data-collection instrument). Many variables are not pertinent to assessing the

adequacy or accuracy of AFS payment rates or Medicare beneficiaries' access to ambulance services (such as variables indicating the number of hours worked by staff for nonambulance responsibilities). Also, many of the cost variables are quite granular, such as specific costs (depreciation, loan interest, purchase price) for each ambulance vehicle that the organization operates. To assess the burden on ambulance organizations of reporting the data and help inform our consideration of whether the data collection should continue, we consulted stakeholders including ambulance organizations, ambulance trade associations, CMS, and RAND (which contracted with CMS to perform the data collection). All stakeholders we spoke with supported continued data collection but emphasized the need to reduce its burden.

The GADCS is a good first step toward a dataset that policymakers can use to effectively evaluate the adequacy of AFS payments. As ambulance organizations become more experienced with collecting and submitting cost data to CMS, the GADCS should be sufficient to allow analysts to evaluate whether aggregate AFS payments are large enough to ensure beneficiary access and the accuracy of AFS payments across patient severity levels or geographic locations. Therefore, the Commission recommends that the Congress direct the Secretary to continue to collect cost and revenue data from ground ambulance organizations, focusing on information essential to assessing both the accuracy of Medicare payments and access to ambulance services for Medicare beneficiaries while pursuing opportunities to minimize burden on providers and suppliers. ■

Since 2002, Medicare has paid for ground ambulance services using the ambulance fee schedule (AFS). In 2024, approximately 10,600 ground ambulance suppliers and providers delivered 11.3 million ambulance transports to fee-for-service (FFS) Medicare beneficiaries, with total Medicare payments for AFS-covered transports of $5.3 billion.

The AFS factors that CMS uses to adjust payments to ambulance organizations generally are not based on cost data, and many of them have remained unchanged since they were implemented. Without cost data, policymakers must rely on indirect measures of payment adequacy such as number of ambulance organizations to determine whether Medicare's aggregate payments to ambulance organizations are adequate to ensure access to care for beneficiaries. Further, the extent to which payments under the AFS align with the costs required to efficiently provide ground ambulance services to beneficiaries with different needs in different locations cannot be determined.

To support analysis of the appropriateness of AFS payments, the Congress directed CMS—via the Bipartisan Budget Act (BBA) of 2018—to undertake a ground ambulance data-collection effort. CMS responded by creating the Medicare Ground Ambulance Data Collection System (GADCS), which gathers detailed information from ambulance organizations on their service areas, total time for ambulance responses, number of responses and transports (volume), service mix (emergency, nonemergency, basic life support, advanced life support, specialty care transport), labor costs, facility costs, vehicle costs, equipment and supply costs, and revenues. The BBA of 2018 also directed the Commission to evaluate the GADCS data, including the burden on ambulance organizations of collecting it, and report to the Congress on the adequacy of Medicare payments for ground ambulance services and geographic variation in the costs of providing those services (see text box on the BBA of 2018, p. 256).

In this chapter, we review Medicare's AFS and the Commission's prior work assessing the adequacy of Medicare's payments for ambulance services. We then describe CMS's GADCS data-collection effort and provide an overall assessment of the dataset. Next, we present findings from interviews with stakeholders regarding the potential value of the GADCS dataset and the burden of data collection and report results from our analyses of the GADCS data. Finally, we make a recommendation to continue to collect a streamlined set of GADCS data.

## Background

Medicare pays for ground ambulance transports for FFS Medicare beneficiaries under the AFS. Ground ambulance services include both emergency and nonemergency transport from the point of patient pickup to an appropriate medical facility or the patient's home. These services include:

- transports to the nearest hospital, critical access hospital (CAH), rural emergency hospital (REH), or skilled nursing facility (SNF) that is capable of furnishing the required level and type of care for the beneficiary's illness or injury;
- transports from a hospital, CAH, REH, or SNF to the beneficiary's home;
- transports from a SNF to the nearest supplier of medically necessary services not available at the SNF where the beneficiary is a resident, including the return trip; and,
- for a beneficiary who is receiving renal dialysis for treatment of end-stage renal disease, from the beneficiary's home to the nearest facility that furnishes renal dialysis, including the return trip.

CMS has defined organizations providing ambulance services as either suppliers (such as local fire departments or private for-profit entities unaffiliated with institutions), which compose 96 percent of all ambulance organizations, or providers (institutions, primarily affiliated with hospitals), representing 4 percent of organizations.

Medicare Part B covers ground ambulance services when other transportation sources would endanger the patient's life and the service is not part of a Part A benefit.[1] Under the AFS, Medicare provides a single payment for the transport to the nearest appropriate facility, including necessary items and services such as oxygen, medications, extra attendants, and electrocardiogram testing. Under the AFS, Medicare

## Section 50203(b)(F) of the Bipartisan Budget Act of 2018

"(F) GROUND AMBULANCE DATA COLLECTION SYSTEM STUDY.—

"(i) IN GENERAL.—Not later than March 15, 2023, and as determined necessary by the Medicare Payment Advisory Commission thereafter, such Commission shall assess, and submit to Congress a report on information submitted by providers and suppliers of ground ambulance services through the data collection system under subparagraph (A), the adequacy of payments for ground ambulance services under this subsection, and geographic variations in the cost of furnishing such services.

"(ii) CONTENTS.—A report under clause (i) shall contain the following:

"(I) An analysis of information submitted through the data collection system.

"(II) An analysis of any burden on providers and suppliers of ground ambulance services associated with the data collection system.

"(III) A recommendation as to whether information should continue to be submitted through such data collection system or if such system should be revised under subparagraph (E)(i).

"(IV) Other information determined appropriate by the Commission."

Section 311 of the Consolidated Appropriations Act of 2022 amended the due date for this report from March 15, 2023, to the second June 15th following the date on which the Secretary transmits data for the first representative sample of providers and suppliers of ground ambulance services to MedPAC. We received the first representative sample in August 2024, so this report is due June 15, 2026. ■

pays for a transport but not for a response that does not result in a transport. A response occurs when an ambulance or other emergency medical vehicle is dispatched; a transport is a response that results in a patient being transported.[2]

### Payment under the ambulance fee schedule

AFS payments consist of two components: a level-of-service payment and a mileage payment. The service payment is the product of three factors: the relative-value unit (RVU), which reflects the relative intensity of the transport; a conversion factor that translates RVUs into dollar amounts; and an adjustment for geographic differences in costs. The mileage payment reflects the costs attributable to the use of the ambulance vehicle (for example, maintenance, fuel, and depreciation) and is the product of miles traveled with the patient and a mileage rate determined by CMS.

The AFS has seven levels of ground ambulance service, each with its own Healthcare Common Procedure Coding System (billing) code and an RVU based on relative service intensity—determined by whether the transport is emergency or nonemergency and the level of clinical staff (basic life support (BLS), advanced life support (ALS), or specialty care transport (SCT)).[3] RVUs for each billing code are set relative to the lowest-intensity service (BLS nonemergency, RVU = 1.00) (Table 6-1).

The conversion factor (CF) translates RVUs into dollar amounts to determine the base payment for ambulance services. In 2026, CMS set the CF at $284.56 for all ground ambulance transports. CMS updates the conversion factor each year by the Consumer Price Index for All Urban Consumers (CPI–U), reduced by the 10-year moving average of multifactor productivity.[4] The CPI–U measures the cost of a market basket of consumer goods and

**TABLE 6–1** **Medicare ground ambulance service levels and associated RVUs, 2026**

| Ground ambulance service level | HCPCS code | RVU |
|---|---|---|
| BLS nonemergency | A0428 | 1.00 |
| BLS emergency | A0429 | 1.60 |
| ALS nonemergency, Level 1 | A0426 | 1.20 |
| ALS emergency, Level 1 | A0427 | 1.90 |
| ALS, Level 2 | A0433 | 2.75 |
| Specialty care transport | A0434 | 3.25 |
| Paramedic ALS intercept | A0432 | 1.75 |

Note: RVU (relative-value unit), HCPCS (Healthcare Common Procedure Coding System), BLS (basic life support), ALS (advanced life support). For each ground ambulance service, the RVU is multiplied by a conversion factor of $284.56 to obtain a payment base rate.

Source: MedPAC analysis of table of ambulance fee schedule services from CMS's ambulance fee schedule public use files.

services and may not accurately measure changes in the costs of providing ambulance services.

To adjust for geographic differences in costs, CMS uses the practice expense (PE) component of the geographic practice cost index (GPCI), based on the ZIP code where the patient is picked up. To determine the service payment for a transport, CMS applies the GPCI to 70 percent of the base payment for ground ambulance transports and adds that product to 30 percent of the unadjusted base payment. The PE GPCIs may not effectively track geographic differences in costs because 34 states have a single PE GPCI value for the entire state. Therefore, in these states, there is no difference in payment between low-cost areas and high-cost areas for the same service.

The mileage payment under the AFS covers vehicle-related costs such as fuel, maintenance, and depreciation. It is calculated by multiplying the miles traveled with the patient—from pickup to the nearest appropriate facility—by a CMS-set base rate. For 2026, the base rate is $9.15 per mile. Each year, CMS updates the base rate by the CPI–U reduced by the 10-year moving average of multifactor productivity.

The AFS includes several add-on payments based on pickup location. For pickups occurring in rural and super-rural areas, the mileage rate is increased by 50 percent for the first 17 miles of transport.[5] Temporary add-ons—effective through December 31, 2027—raise service and mileage payments by 3 percent for rural transports and 2 percent for urban transports. Additionally, super-rural transports receive the temporary 3 percent rural increase and a temporary 22.6 percent increase to the service component of the payment (Table 6-2, p. 258).

## The ambulance payment system was largely developed without cost data

The AFS includes payment adjustments for three factors:

- transport intensity (via the RVUs),
- geographic location of the patient pickup (urban, rural, or super rural), and
- geographic differences in costs (via the PE GPCIs).

None of these adjustments are based on cost data from ambulance organizations, except for the adjustment for super-rural location. Use of the RVUs and the GPCIs was determined from deliberations in negotiated rulemaking in 2002 (Centers for Medicare & Medicaid

**TABLE 6–2** **Medicare's ambulance fee schedule payment formulas for services and mileage, 2026**

| Payment category | Payment formula |
|---|---|
| Service payment | |
| Urban pickup | RVU × $284.56 × (0.7 × PE GPCI + 0.3) × 1.02 |
| Rural pickup | RVU × $284.56 × (0.7 × PE GPCI + 0.3) × 1.03 |
| Super-rural pickup | RVU × $284.56 × (0.7 PE GPCI + 0.3) 1.03 × 1.226 |
| Mileage | |
| Urban pickup | Miles × $9.15 × 1.02 |
| Rural and super-rural pickup, first 17 miles | Miles × $9.15 × 1.03 × 1.5 |
| Rural and super-rural pickup, 17+ miles | (Miles – 17) × $9.15 × 1.03 |

Note: RVU (relative-value unit), PE GPCI (practice expense geographic practice cost index). CMS defines rural areas as ZIP codes outside of metropolitan statistical areas (MSAs) or in a rural census tract within an MSA; super-rural areas as ZIP codes located in rural counties that are among the lowest quartile of all rural counties by population density; and urban areas as ZIP codes in MSAs modified to exclude rural census tracts in MSAs. The payments listed in this table occur only if an ambulance response results in a patient transport. Responses that do not result in a transport are not covered under the ambulance fee schedule.

Source: MedPAC analysis of table of ambulance fee schedule services from CMS's ambulance fee schedule public use files.

Services 2002). The RVUs are of particular concern because they have not been updated since then. The temporary 2 percent add-on for urban transports and 3 percent add-on for rural transports were established by the Congress and did not have an underlying empirical basis (Centers for Medicare & Medicaid Services 2002). The temporary 22.6 percent add-on for super-rural transports was based on 1999 data from the Project Hope Center for Health Affairs (Centers for Medicare & Medicaid Services 2004, Government Accountability Office 2003). Congress has extended these add-ons at different intervals since their implementation. The add-ons are currently effective through December 31, 2027.

The Government Accountability Office (GAO) previously collected cost and revenue data on ambulance organizations in 2004 and 2010 in response to a mandate from the Congress to evaluate the adequacy of payments under the AFS (Government Accountability Office 2012). However, those datasets were limited, covering only a few hundred organizations and excluding those that shared costs with other entities (fire departments, police departments, hospitals). These excluded organizations tended to be government owned, low volume, and urban, so the GAO data might not have been nationally representative.

## Prior MedPAC work on ambulance payment

In June 2013, the Commission published a report on Medicare payments for ambulance services under the AFS (Medicare Payment Advisory Commission 2013). The report concluded that the continued entry of private equity and for-profit organizations into the ambulance market indicated the availability of profit opportunities. However, the Commission's report also indicated that AFS payments might not accurately track variation in costs. Though no cost data were available to comprehensively assess the adequacy or accuracy of ambulance payments, the available evidence suggested that Medicare's add-on payments were poorly targeted. While the super-rural designation boosted payments for isolated, low-volume providers, it also benefited providers in midsize micropolitan areas that may not face the same challenges in furnishing ambulance services. However, without cost data, the Commission was not able to determine to what extent the urban, rural, and super-rural add-on payments should have been adjusted.

In that report, the Commission recommended that the Congress:

- allow the three temporary add-on payments (2 percent for urban transports, 3 percent for rural and super-rural transports, and an additional 22.6 percent for super-rural transports) to expire;
- replace the permanent rural and super-rural 50 percent add-on payment for the first 17 miles of a transport with an add-on payment for transports provided by low-volume organizations and that originate in geographically isolated areas to better target payments to organizations with high costs due to factors beyond their control;
- enact a series of measures to reduce clinically inappropriate use of BLS ground ambulance services; and
- lower payments for nonemergency BLS transports and transfer those savings to payments for emergency transports in a budget-neutral manner.

## Accurate cost data needed to assess payment accuracy and access to care

Accurate cost data provide important information about how well a payment system functions. It is important that cost data allow CMS to set payment rates that accurately reflect the relative costs of providing services to help ensure that health care providers make delivery-of-care decisions based on clinical rather than financial considerations. For example, each year, the Commission uses cost data, where available, to assess the adequacy of Medicare's FFS payment systems for hospitals, skilled nursing facilities, home health agencies, inpatient rehabilitation facilities, dialysis facilities, and hospices.

To help policymakers understand how well the AFS is functioning, ambulance cost data can help policymakers determine whether:

- the aggregate of all payments under the AFS is high enough to ensure that ambulance organizations are willing to provide services to FFS Medicare beneficiaries;
- the values of the RVUs in the AFS accurately represent differences in resource needs across service levels;
- current payment adjustments for urban, rural, and super-rural transports accurately reflect the differences in the cost of providing ambulance services across these geographic definitions; and
- other factors that affect the costs of providing ground ambulance services are accounted for in AFS payments.

Part of our evaluation of the GADCS data involves assessing whether the dataset can be used to make these determinations.

## GADCS dataset allows for effective analysis of ambulance costs and payments, but it needs refinement

In response to a congressional mandate, CMS created the GADCS, which includes data for 2022 and 2023 from about 71 percent of all ground ambulance organizations, including information from organizations that share costs with other entities. The GADCS contains a rich set of variables, including information on organizational characteristics, service area, service volume, response times, staffing and service mix, and certain categories of costs and revenues. The data are a valuable resource for assessing the appropriateness of AFS payments and could be used to identify adjustments to the payment rates that would improve payment accuracy. However, the GADCS includes over 600 variables (though due to the structure of the GADCS instrument, organizations often were not required to answer all the questions), with very specific cost variables and other variables that are not pertinent to assessing the adequacy or accuracy of AFS payment rates or Medicare beneficiaries' access to ambulance services.

### CMS's ground ambulance data-collection effort

In the BBA of 2018, the Congress directed CMS to establish a ground ambulance data-collection effort. CMS responded by creating the GADCS. To collect the GADCS data, CMS divided ground ambulance

organizations into four cohorts—Year 1 through Year 4—based on the order in which the organizations were sampled to participate in the GADCS. Year 1 included organizations active in 2017, Year 2 in 2018, and Years 3 and 4 in 2020. The BBA of 2018 required ambulance organizations to participate in the GADCS. Organizations that did not furnish the requested data were subject to a one-year, 10 percent payment reduction on AFS ground ambulance services in a subsequent calendar year.

The four cohorts combined included 10,581 organizations. CMS collected data from the Year 1 and Year 2 organizations during 2023 and from the Year 3 and Year 4 organizations during 2024, and 84 percent of these organizations were still billing Medicare when CMS collected the data. Of these remaining organizations, 86 percent (7,572) submitted and certified a complete response to CMS (meaning they had completed all data fields). A small number of organizations (313) were not actively billing Medicare (so they could not complete all data fields) during the data-collection years but submitted data, for a total of 7,885 submitted and certified (but not always complete) GADCS responses.

While CMS collected data for the Year 1 and Year 2 cohorts during 2023, the data that the organizations submitted were from one-year periods that began in 2022. Likewise, CMS collected the data from the Year 3 and Year 4 cohorts during 2024, but the data were from a one-year period that began in 2023. CMS allowed the Year 1 and Year 2 organizations to select a "data year" that started either January 1, 2022, or the start of the organization's annual accounting period in 2022. CMS made the same allowance for the Year 3 and Year 4 organizations for submission of their 2023 data.

## The GADCS allows for detailed analysis of ambulance organizations' costs

The GADCS dataset provides a rich set of variables that allow for detailed analysis of ambulance organizations' operations and costs (see Table 6-3 for key data elements used to produce the empirical results in this report).

The GADCS includes data from about 71 percent of all ground ambulance organizations and captures information from those that share costs with other entities (fire departments, police departments, or hospitals). Previous ground ambulance datasets had excluded organizations that shared costs because difficulties separating the ambulance costs from the entity with which costs were shared made the data unreliable. For the GADCS, CMS worked with the organizations that share costs to ensure the reliability of their data. As a result, the GADCS data are useful to policymakers to analyze the adequacy of AFS payments and estimate whether the AFS payments appropriately vary with the cost of caring for beneficiaries with different needs in different locations. CMS found that organizations that were for profit or had relatively low transport volume were less likely to complete the GADCS reporting requirement, so the agency was concerned that the participating organizations were not a nationally representative sample. As a result, the GADCS includes survey weights that can be used to create nationally representative empirical results.[6]

## Concerns about the GADCS data

The GADCS is a major step forward in understanding ambulance organizations' costs. If collection of the GADCS data is continued, the data would be a valuable resource for assessing the appropriateness of AFS payments and identifying adjustments to the payment rates that would improve payment accuracy.

However, the GADCS includes over 600 variables, and not all are necessary for evaluating ambulance costs or beneficiaries' access to ambulance services. For example, in our analysis of ambulance costs, we used 181 variables to generate the empirical results presented later in this chapter, and many of those variables were more granular than needed. Examples of variables that may not be needed to evaluate the AFS include whether the organization is the primary provider in its service area, whether the organization has a secondary service area (with several related questions), the work hours that ambulance personnel spend on nonambulance responsibilities, and the number of facilities and vehicles owned by the reporting organization (with several questions related to each facility). Given the size and complexity of the dataset, collecting and submitting the data could be burdensome, especially for small ambulance organizations. Streamlining the GADCS could reduce this burden while preserving its analytical value.

At the same time, the GADCS does not separately estimate the costs specifically associated with

**TABLE 6–3**

**GADCS variables used in MedPAC's analysis**

| Variable category | Variables used |
|---|---|
| **Organizational characteristics** | Type of ownership (for profit, nonprofit, government), use of volunteer labor, affiliation (fire/police department, hospital, or independent), and service area classification (urban, rural, super rural) |
| **Response times** | The time from when a call comes in to dispatch to when a ground ambulance or other EMS vehicle arrives at the patient's location |
| **Service volume** | Number of responses and transports |
| **Staffing mix** | Hours worked by volunteers; hours worked and compensation for EMRs, EMTs, paramedics, nurses, physicians, drivers, and administrative staff |
| **Service mix** | Emergency versus nonemergency responses; share of transports that are BLS, ALS, and SCT |
| **Cost categories** | Cost of labor, facilities, vehicles, equipment, supplies, and medications for ground ambulance services provided to all patients; cost for contracted services such as billing and accounting |
| **Sources of payment for ground ambulance services** | Payments from FFS Medicare, Medicare Advantage, Medicaid, TRICARE, Veterans Health Administration, commercial insurance, workers' compensation, and patient self-pay |
| **Revenue from sources other than payment for ground ambulance services** | Revenue from 21 sources that are not related to billing for services, such as from local government funding, contracted services, grants, and charitable donations |
| **Total organization revenue** | Revenue from all sources, some of which are not specified in the GADCS |

Note: GADCS (Medicare Ground Ambulance Data Collection System), EMS (emergency medical service), EMR (emergency medical responder), EMT (emergency medical technician), BLS (basic life support), ALS (advanced life support), SCT (specialty care transport), FFS (fee-for-service). CMS assigned "service area classification" based on which category had the largest share of an organization's FFS Medicare transports. We constructed many of the variables listed using more granular variables in the GADCS. For a list of all the GADCS variables we used, see the Excel data file accompanying this chapter, available at https://www.medpac.gov/document/june-2026-report-to-the-congress-medicare-and-the-health-care-delivery-system/.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

providing ground ambulance services to FFS Medicare beneficiaries. Lack of Medicare-specific data could make it difficult to use the GADCS to evaluate the adequacy of AFS payments. However, our analysis of the GADCS cost data indicates that the cost of providing ground ambulance services to FFS Medicare beneficiaries is similar to the cost of providing ground ambulance services to all patients (see text box on patients' costs, pp. 268–269). Therefore, using the current GADCS, analysts could calculate cost per transport for all patients (including those who are not FFS Medicare beneficiaries), which could be compared with the AFS payment rates. This comparison could be useful in analyzing of the adequacy of AFS payment rates.

## Stakeholders support continued collection of a more streamlined dataset

The BBA of 2018 requires that the Commission analyze the burden on organizations associated with the data-collection system and recommend whether data collection should continue or should be revised. To

obtain information about the burden of the data collection and how the GADCS could be improved, we spoke with representatives from trade associations, CMS, RAND (which CMS contracted with to help determine the data to collect), and ground ambulance organizations during the summer and fall of 2025.

All of the entities we interviewed conveyed that it would be beneficial to continue the data collection and that discontinuation would be a mistake. Interviewees—which represented a broad range of ambulance companies (for profit, nonprofit, urban, rural, large, small)—said that some organizations, especially smaller ones, had difficulties collecting and submitting the data, and some organizations required a lot of assistance to complete their reporting requirements. Despite these difficulties, they agreed that the high participation rate among the organizations indicates strong organizational engagement. Also, interviewees observed that because ambulance organizations had incurred start-up costs associated with the new data-collection effort, it would be unfortunate to discontinue collecting the data after just one iteration. These interviewees reported that the quality of the data should improve as organizations gain more experience with the data-collection instrument.

Although all of the stakeholders that we interviewed supported continued data collection, some noted that the current data-collection instrument could be streamlined without a loss in effectiveness. For example, the reporting requirement instrument is very granular concerning questions about costs for labor, vehicles, and facilities. Organizations commented that the burden of the data collection would be reduced if these questions were at a more aggregated level. Therefore, streamlining could be accomplished by reducing the number of questions in the GADCS reporting requirement and by having only a subset of the organizations complete the reporting requirement each year. Finally, a representative from one of the trade associations emphasized that because the AFS payment adjustments were largely created without cost data, discontinuing the GADCS would hinder efforts to improve payment accuracy in the AFS.

## Substantial variation among ground ambulance organizations in services provided and costs

The BBA of 2018 requires the Commission to provide information about the adequacy of Medicare payments for ambulance services and geographic variations in the costs of providing services. It is important to know whether the current AFS payment adjustments reflect the key drivers of the ambulance organizations' costs. Therefore, for this report we identified the factors that affect ambulance costs, assessed whether current AFS payment adjustments reflect those factors, and compared the organizations' costs with their revenues.

We analyzed the GADCS data and found that the strongest driver of differences in ground ambulance cost per transport between organizations is the volume of transports that an organization provides. As the number of transports increases, costs grow at a much lower rate, which is suggestive of economies of scale. This result is consistent with analyses by GAO and a previous analysis by the Commission (Government Accountability Office 2012, Government Accountability Office 2007, Medicare Payment Advisory Commission 2013). In addition, we found that cost per transport is lower for for-profit organizations relative to nonprofit and government-owned organizations. Cost per transport is also lower for organizations that use a dynamic staffing model (meaning the number of fully staffed ambulance units varies by day, time, or season) compared with those that use a static staffing model (meaning the number of fully staffed ambulance units does not change over time). Finally, we found that organizations that have rural service areas have lower cost per transport than organizations that have urban service areas if we control for other factors that affect costs, such as number of transports, which is consistent with results from GAO studies (Government Accountability Office 2012, Government Accountability Office 2007).

Finally, we compared organizations' revenues with their costs by calculating revenues divided by costs. We found extremely wide variation among the organizations, with large differences between low-volume organizations and high-volume organizations and between government-owned organizations and for-profit organizations.

## Methods

Earlier studies of ambulance costs relied on data from only a few hundred of the more than 10,000 organizations that provide ambulance services to Medicare beneficiaries (Centers for Medicare & Medicaid Services 2015, Government Accountability Office 2012, Government Accountability Office 2007, Government Accountability Office 2003). These studies excluded many very small organizations and those that shared costs with other entities—such as fire departments, police departments, or hospitals—due to concerns about data reliability. To address these concerns, CMS provided extensive support to organizations participating in the GADCS to improve data quality and completeness.

To assess the reliability of GADCS data from organizations that share costs with fire departments, police departments, or hospitals, we compared their reported costs and revenues with those of organizations that do not share costs. While organizations that shared costs were more likely to report implausibly high values, these cases were rare. After excluding these outliers, we found no substantial differences between the two groups. As a result, we applied only minimal exclusions to the GADCS data used in our analysis.

To prepare the GADCS data for analysis, we first calculated cost and revenue per response for each organization that did not share costs with another entity (52 percent of the organizations). We excluded organizations with values more than three standard deviations above the mean—specifically, cost per response over $20,067 or revenue from ground ambulance operations per response over $31,025—removing 66 organizations. We applied the same exclusion criteria to organizations that shared costs (48 percent of the organizations), which excluded an additional 50 organizations.

We also excluded 313 organizations that were not actively billing Medicare, as well as 6 organizations with critical data issues (zero reported staff hours, no revenue, invalid ZIP codes, or missing transport counts). After these edits, our final analytic sample included 7,450 organizations (70 percent of the 10,581 organizations in the four cohorts that CMS sampled for the GADCS).

To ensure that the results from our analysis presented in this report were nationally representative, we used the survey weights that the GADCS provides.

## Majority of ambulance organizations are government owned, urban, and use a static deployment model

We evaluated descriptive characteristics of the ground ambulance organizations including type of ownership, location of service area (urban, rural, or super rural), and type of staff deployment used (static, dynamic, or hybrid). Under static deployment, the organization never changes the number of fully staffed ambulance units, meaning that the ambulance provider is fully staffed 24/7. Under dynamic deployment, the organizations change the number of fully staffed ambulance units over time. Hybrid deployment is a mix of static and dynamic deployment.

We found that more than 50 percent of the organizations had an urban service area, were government owned, or used a static deployment model. However, distribution of transports among these categories is different from the number of organizations. For example, there were fewer for-profit organizations than government-owned or nonprofit organizations, but for-profit organizations provided more ground ambulance transports than the other two ownership categories. Also, while slightly more than half of the organizations had urban service areas, the urban organizations had 82 percent of the ground ambulance transports (Table 6-4, p. 264).

An important finding from these descriptive statistics is that over half of the organizations are government owned, which is different from other health care sectors. For example, only about 20 percent of acute care hospitals are government owned. In addition, most of the government-owned ambulance organizations also provide fire or other first response services. Finally, a majority of urban, rural, and super-rural organizations are government owned—51 percent, 56 percent, and 65 percent, respectively (data not shown).

## Average service intensity was higher for government-owned organizations than for-profit organizations and nonprofit organizations

Transport intensity can influence ambulance service costs, as reflected in the AFS's seven service levels, each

**TABLE 6–4**

**The majority of ground ambulance organizations were urban, government owned, or used a static deployment model, 2022 and 2023**

| Organization category | Number of organizations | Share of organizations | Number of transports | Share of transports |
|---|---|---|---|---|
| Primary service-area location | | | | |
| Urban | 5,539 | 53.5% | 40,997,213 | 82.2% |
| Rural | 2,876 | 27.8 | 7,041,153 | 14.1 |
| Super rural | 1,943 | 18.8 | 1,863,064 | 3.7 |
| Ownership | | | | |
| For profit | 1,937 | 18.7 | 20,995,123 | 42.1 |
| Nonprofit | 2,769 | 26.7 | 9,692,384 | 19.4 |
| Government | 5,652 | 54.6 | 19,213,923 | 38.5 |
| Type of staffing model | | | | |
| Static | 5,764 | 55.6 | 16,725,633 | 33.5 |
| Dynamic | 2,516 | 24.3 | 17,228,415 | 34.5 |
| Hybrid | 2,078 | 20.0 | 15,947,382 | 32.0 |
| Total | 10,358 | | 49,901,430 | |

Note: CMS assigned "service-area location" (urban, rural, or super rural) based on which category had the largest share of an organization's fee-for-service Medicare transports. "Rural" areas are ZIP codes outside of metropolitan statistical areas (MSAs) or in a rural census tract within an MSA; "super-rural" areas are ZIP codes located in rural counties that are among the lowest quartile of all rural counties by population density; and "urban" areas are ZIP codes in MSAs modified to recognize rural census tracts in MSAs. "Number of transports" is transports for all patients. For some groups, the percentages do not sum to 100 due to rounding.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

assigned a different RVU based on service intensity. Using GADCS data, we analyzed transport intensity by ownership type—for profit, government owned, and nonprofit—based on the share of transports that were nonemergency, BLS, ALS, or SCT. We found that government-owned organizations had a notably lower share of nonemergency transports—8.9 percent, compared with 48.7 percent for for-profit organizations and 25.4 percent for nonprofit organizations (Table 6-5). By contrast, government-owned organizations had a higher share of ALS transports (56.5 percent) compared with for-profit and nonprofit organizations (32.2 percent and 43.7 percent, respectively). These findings indicate higher service intensity among the government-owned organizations. The effect that the share of transports that are nonemergency has on organization costs is reflected in Table 6-8 (p. 271), which indicates that a 10 percentage point increase in the share of transports that are nonemergency decreases costs by 4.2 percent.

## Ground ambulance cost per transport varies substantially among ambulance organizations

For each organization in our analytic file, we calculated total costs for ground ambulance services as the sum of ground ambulance costs for labor (response staff, administration, and nurses/physicians), facility (lease, rent, mortgage, insurance, maintenance, utilities, and taxes), vehicles (purchase, lease, remount, license, taxes, fuel, and maintenance), equipment, supplies, and medications. We also calculated for each organization the average RVU of their ambulance transports, which is a measure of service intensity. Due to data limitations, our analysis used costs for all patients, not costs specific to the services provided to FFS Medicare beneficiaries. However, an analysis of the data found

**TABLE 6–5**

**Government-owned organizations had fewer nonemergency and more advanced life support services than for-profit and nonprofit organizations, 2022 and 2023**

| Organization ownership category | Share of transports that are nonemergency | Share of transports that are: | | |
|---|---|---|---|---|
| | | BLS | ALS | Specialty care |
| For profit | 48.7% | 65.9% | 32.2% | 1.8% |
| Nonprofit | 25.4 | 54.4 | 43.7 | 1.9 |
| Government owned | 8.9 | 43.0 | 56.5 | 0.4 |

Note: BLS (basic life support), ALS (advanced life support). A "transport" is an ambulance response that results in a patient being transported to another location, such as a hospital or dialysis facility. The components in the first row and the third row do not sum to 100 percent due to rounding.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System from CMS.

that the cost of providing services to all patients is sufficiently close to the cost of providing services to FFS Medicare beneficiaries to provide a reasonable representation (see text box, pp. 268–269).

We found that ground ambulance cost per transport varied widely across organizations. At the 90th percentile, costs were $4,136—11 times higher than the 10th percentile value of $367. We also examined how cost per transport and RVUs per transport differed by organization service area (urban, rural, super rural), ownership type (for profit, nonprofit, government), transport volume, and staffing model (static, dynamic, or hybrid).

Cost per transport was similar for urban and rural service areas—$1,018 and $997, respectively—but was more than 20 percent higher in super-rural service areas, $1,263. However, the average RVU per transport was consistent across geographic areas, suggesting that service intensity and associated revenue levels were comparable (Table 6-6, p. 266).

In contrast, cost per transport varied widely by ownership type. For-profit organizations had the lowest average cost ($563), followed by nonprofit organizations ($830) and government-owned organizations ($1,626). For-profit organizations also reported lower average RVUs, indicating less intense transports.

The higher costs among government-owned organizations were partially offset by local government funding. Thirty percent of these organizations received such funding, with an average of $322 per transport—substantially more than nonprofit ($32) and for-profit ($12) organizations.

We also found large cost differences by type of staffing model. Organizations using a dynamic or hybrid staffing model had substantially lower cost per transport ($636 and $918, respectively) compared with those using a static staffing model ($1,524) (Table 6-6, p. 266). The organizations using a dynamic or hybrid staffing model also reported lower average RVUs (1.53 and 1.52, respectively) than organizations using a static staffing model (1.72), indicating lower average service intensity.

Transport volume had the greatest impact on cost per transport. We grouped organizations into quartiles by transport volume and found that cost per transport ranged from $2,878 in the lowest quartile to $918 in the highest. Despite these differences, average RVUs per transport were similar across the three lowest-volume quartiles and only 5 percent lower in the highest-volume quartile relative to the lowest-volume quartile, indicating that smaller organizations face higher costs not due to service intensity but likely due to scale inefficiencies. These findings align with prior GAO studies that highlighted the effect of volume on ambulance costs (Government Accountability Office 2012, Government Accountability Office 2007, Government Accountability Office 2003).

**TABLE 6–6**

**Substantial differences in size and cost among ambulance organizations, 2022 and 2023**

| Organization category | Number of organizations | Mean transports | Mean cost per transport | Average RVU of services |
|---|---|---|---|---|
| Primary service-area location | | | | |
| Urban | 5,539 | 7,402 | $1,018 | 1.58 |
| Rural | 2,876 | 2,448 | 997 | 1.61 |
| Super rural | 1,943 | 959 | 1,263 | 1.64 |
| Ownership | | | | |
| For profit | 1,937 | 10,838 | 563 | 1.44 |
| Nonprofit | 2,769 | 3,500 | 830 | 1.62 |
| Government | 5,652 | 3,400 | 1,626 | 1.74 |
| Type of staffing model | | | | |
| Static | 5,764 | 2,902 | 1,524 | 1.72 |
| Dynamic | 2,516 | 6,847 | 636 | 1.53 |
| Hybrid | 2,078 | 7,674 | 918 | 1.52 |
| Number of transports by quartile | | | | |
| Lowest quartile | 2,590 | 148 | 2,878 | 1.65 |
| Second quartile | 2,589 | 714 | 1,934 | 1.70 |
| Third quartile | 2,590 | 2,121 | 1,406 | 1.67 |
| Highest quartile | 2,589 | 15,291 | 918 | 1.57 |

Note: RVU (relative-value unit). A "transport" is when a ground ambulance is called to a site and the patient is picked up and transported to another site. CMS assigned "service-area location" (urban, rural, or super rural) based on which category had the largest share of an organization's fee-for-service Medicare transports. "Rural" areas are ZIP codes outside of metropolitan statistical areas (MSAs) or in a rural census tract within an MSA; "super-rural" areas are ZIP codes located in rural counties that are among the lowest quartile of all rural counties by population density; and "urban" areas are ZIP codes in MSAs modified to recognize rural census tracts in MSAs. All dollar figures have been deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

In 2013, the Commission recommended that the Congress direct the Secretary to replace the permanent rural short-mileage add-on for ground ambulance transports with a new budget-neutral adjustment directing increased payments to ground transports provided by low-volume organizations that originate in isolated areas (Medicare Payment Advisory Commission 2013). Our rationale was that transport volume was a strong driver of organizations' costs and that AFS payments should therefore be adjusted to better support low-volume organizations. However, the Commission also recommended that these adjustments should be targeted at organizations that are low volume because of geographic isolation, not because they are located near another organization. In contrast, the current rural and super-rural adjustments increase payments for all transports, regardless of whether the rural/super-rural organization is low volume or high volume.

Although Table 6-6 highlights several factors that affect cost per transport, interactions among these variables complicate interpretation. For instance, for-profit organizations tend to have lower costs and are more likely to use a dynamic staffing model. Because they also perform more transports than nonprofit and government organizations, it is difficult to isolate whether their lower costs stem from volume, efficiency, or both. Therefore, we have performed cross tabulations of type of ownership with type of staffing model and with quartile of transport volume to help clarify the extent of interaction between these variables.

**TABLE 6–7**

**For-profit organizations have relatively high shares of organizations with dynamic staffing models and high transport volumes, which partially explains the relatively low costs reported by these organizations, 2022 and 2023**

| Organization category | Share of organizations in category | Mean cost per transport | Mean number of transports |
|---|---|---|---|
| For profit | | | |
| Static staffing | 29.5% | $840 | 4,751 |
| Dynamic staffing | 38.7 | 538 | 13,835 |
| Hybrid staffing | 31.8 | 500 | 12,840 |
| Nonprofit | | | |
| Static staffing | 49.2 | 1,204 | 1,892 |
| Dynamic staffing | 28.1 | 647 | 4,901 |
| Hybrid staffing | 22.8 | 750 | 5,245 |
| Government | | | |
| Static staffing | 67.8 | 1,759 | 2,985 |
| Dynamic staffing | 17.5 | 958 | 3,080 |
| Hybrid staffing | 14.7 | 1,736 | 5,690 |
| For profit | | | |
| Lowest quartile of transports | 11.8 | 4,294 | 111 |
| Second quartile of transports | 11.7 | 1,168 | 742 |
| Third quartile of transports | 24.1 | 666 | 2,196 |
| Highest quartile of transports | 52.4 | 547 | 19,468 |
| Nonprofit | | | |
| Lowest quartile of transports | 30.2 | 2,149 | 151 |
| Second quartile of transports | 28.7 | 1,467 | 705 |
| Third quartile of transports | 22.9 | 1,212 | 2,105 |
| Highest quartile of transports | 18.2 | 695 | 15,230 |
| Government | | | |
| Lowest quartile of transports | 27.0 | 3,122 | 151 |
| Second quartile of transports | 27.8 | 2,282 | 714 |
| Third quartile of transports | 26.3 | 1,733 | 2,106 |
| Highest quartile of transports | 18.9 | 1,530 | 13,783 |

Note: A "transport" is when a ground ambulance is called to a site and the patient is picked up and transported to another site. All dollar values have been deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

These cross tabulations provide some insight into why for-profit organizations have lower cost per transport than government organizations. The for-profit organizations have a disproportionately high share of organizations with a dynamic staffing model and a disproportionately high share in the highest quartile of transports (Table 6-7). In contrast, government-owned organizations have a disproportionately high share of organizations that have a static staffing model and a disproportionately high share of organizations in the lowest quartile of transports. However, these cross tabulations do not explain all of the reasons that for-profit organizations have lower costs than government-owned organizations. In nearly all of the cross-tabulation cells for the for-profit organizations, cost per transport is lower than in the analogous cells

## Cost of all patients is similar to cost of FFS Medicare patients

Due to data limitations, some may be concerned that the cost data in the Medicare Ground Ambulance Data Collection System (GADCS) reflect the costs of all patients and do not specify the costs of providing ambulance services to fee-for-service (FFS) Medicare beneficiaries. The basis of this concern is that if the cost of serving Medicare beneficiaries is different from the cost of serving all other patients, it will be difficult to determine the overall adequacy of payments from the Medicare ambulance fee schedule (AFS) using the GADCS data.

We analyzed whether the cost of serving FFS Medicare beneficiaries is different from that of all other beneficiaries. We used Medicare claims for FFS Medicare beneficiaries with data from the GADCS to calculate for each ambulance organization the share of all of their transports that were for FFS Medicare beneficiaries. We found that, in general, there is little difference between cost per transport for organizations that have low shares of transports for Medicare beneficiaries and those that have high shares. However, we also found that organizations with extremely low shares of FFS Medicare beneficiaries have relatively low cost per transport, and those that have extremely high shares have relatively high cost per transport (Figure 6-1). Nevertheless, because cost per transport is similar for a broad range of share of transports that are for Medicare beneficiaries, we conclude that the GADCS cost data provide a reasonable estimate of the cost of providing ground ambulance services to FFS Medicare beneficiaries.

A regression analysis confirmed the relationship between ground ambulance costs and share of transports that are for FFS Medicare beneficiaries, suggested in Figure 6-1. We added to the regression used to produce the results in Table 6-8 (p. 271) an explanatory variable for the share of transports that were for FFS Medicare beneficiaries. When we used the full sample of organizations used to produce the results in Table 6-8, we found that the coefficient

*(continued next page)*

for the government organizations. For example, the for-profit organizations have lower costs than government organizations in each of the staff-deployment cells. The lower cost per transport for for-profit organizations could also be due in part to the for-profit organizations having a lower service intensity, on average, than the government organizations (Table 6-5, p. 265, and Table 6-6, p. 266).

### Regression analysis indicates that larger ambulance organizations benefit from economies of scale and that AFS payment adjustments may not be well targeted

To isolate the effects of various factors on ambulance organization costs, we conducted a regression analysis. The model included organizations' total costs as the dependent variable and the following explanatory variables:

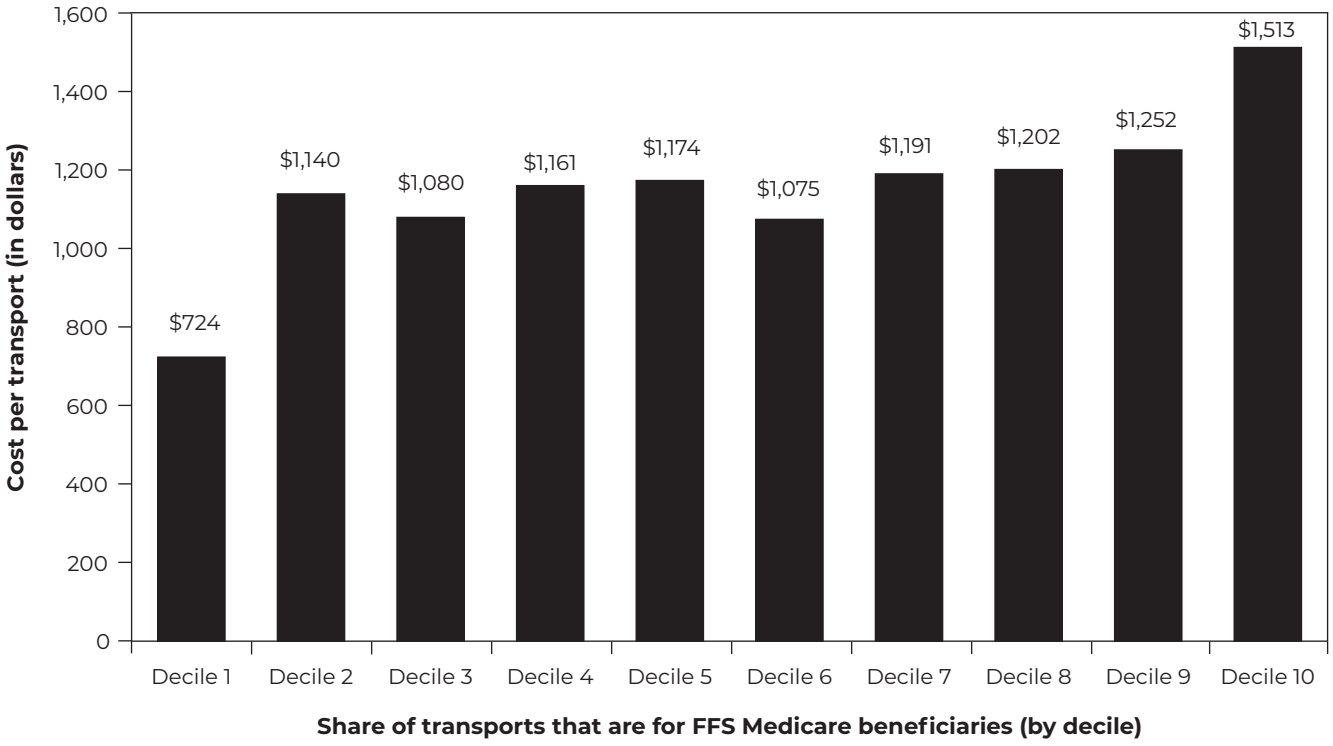
- **Operational characteristics:** Number of transports, average trip time, share of transports that were nonemergency, and type of staffing model (static, dynamic, or hybrid)[7]
- **Profile of labor inputs:** Share of all labor hours that were volunteer hours[8]
- **Financial factor:** Share of revenue from ground ambulance operations that was from local tax revenue

## Cost of all patients is similar to cost of FFS Medicare patients (cont.)

on share of transports that were for FFS Medicare beneficiaries was significant. But when we excluded the organizations that had the 10 percent lowest shares and those that had the 10 percent highest shares, the coefficient on the share of transports that were for FFS Medicare beneficiaries was very small and not statistically significant. ■

**FIGURE 6–1**

**Cost per transport does not vary much by Medicare share, except for organizations with the highest and lowest shares, 2022 and 2023**




Note: FFS (fee-for-service). This chart sorts ambulance organizations by the share of their ground ambulance transports that are for FFS Medicare beneficiaries. The bars indicate the median cost per transport in each decile. All dollar values have been deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Ground Ambulance Data Collection system and Medicare ambulance claims data.

- **Organizational characteristics:** Ownership type (for profit, nonprofit, or government owned), service-area location (urban, rural, or super rural)
- **Adjustment for geographic differences in costs:** PE GPCI

We selected these variables because they represent the factors that we expect to influence the costs that ambulance organizations incur when providing ground ambulance services. However, we would not use all of these variables in an analysis to determine how AFS payment rates should be adjusted for relevant factors

because many of these variables are impractical (such as type of staffing model) or could create problematic incentives (such as average trip time) (see text box on the regression analysis, pp. 272–273).

Because the ground ambulance cost data are right skewed, we used the natural logarithm of the organizations' costs as the dependent variable rather than the organizations' nontransformed costs.[9] We also log-transformed two continuous explanatory variables, number of transports and the PE GPCI values. Finally, we used the GADCS organization-level survey weights in the regression to produce nationally representative results.

The regression had an $R^2 = 0.75$ and identified several statistically significant predictors of cost: transport volume, average trip time, share of labor hours that were attributed to volunteer workers, share of transports that were nonemergency, share of revenue from local taxes, rural service area (vs. urban), ownership type (government or nonprofit vs. for profit), whether the organization does standby events, PE GPCI, and staffing model (dynamic or hybrid vs. static) (Table 6-8).

While the regression identified several significant cost drivers, two are particularly relevant when considering how AFS payments should be adjusted to ensure payment adequacy: transport volume and service-area location (urban, rural, super rural).

### Transport volume strongly affects ambulance costs

The coefficient for the natural log of transport volume is especially important because it is less than 1.0 (0.73), which indicates economies of scale, meaning that costs rise at a slower rate than volume (Table 6-8). For example, increasing the number of transports by 10 percent results in total costs rising by only 7 percent, resulting in a 2.5 percent reduction in cost per transport.[10] This finding suggests that larger organizations have a financial advantage over smaller ones, a finding consistent with studies by GAO and CMS (Buttorff et al. 2025, Government Accountability Office 2012, Government Accountability Office 2007, Government Accountability Office 2003).

The AFS does not have a payment adjustment based on transport volume, but the Commission and the GAO have both suggested volume-based payment adjustments. The Commission also emphasized in our 2013 report that a volume-based payment adjustment should be directed toward organizations that are low volume because they serve isolated areas and not toward organizations that are low volume because they are located near other organizations.

### Relationship between ground ambulance costs and location of organization's service area

The AFS provides payment adjustments for whether a ground ambulance pickup occurs in an urban, rural, or super-rural area. The payment adjustments are larger for rural pickups than for urban pickups and are larger for super-rural pickups than for rural pickups. However, our regression results suggest that organizations serving rural areas have 15 percent lower costs than organizations serving urban locations when controlling for other factors that affect costs such as number of transports. We also found that the difference in costs between urban and super-rural organizations is not statistically significant (Table 6-8).[11]

Our results describing the relationship between organization costs and whether the organization primarily serves a rural, super-rural, or urban area are not inconsistent with the results of a study by GAO (Government Accountability Office 2012). However, the results from our analysis may be more accurate than GAO's results because the GADCS data represent far more ambulance organizations (about 7,500 organizations) than the GAO dataset (154 organizations). Further, our empirical findings suggest that factors such as service volume, type of ownership, and deployment model are more important drivers of ambulance costs than whether an organization serves a rural, super-rural, or urban area. These findings are consistent with the Commission's 2013 recommendation to retarget the rural and super-rural 50 percent add-on for the first 17 miles of a transport toward providers that are low volume and geographically isolated (Medicare Payment Advisory Commission 2013). Because rural and super-rural organizations tend to provide far fewer transports than urban organizations (Table 6-6, p. 266) and are more likely to be geographically isolated, such an approach would disproportionately benefit rural and super-rural organizations while better targeting those most in need.

**TABLE 6–8**

**Regression results suggest that transport volume significantly affects ground ambulance costs, with larger organizations benefiting from economies of scale, 2022 and 2023**

| Variable | Coefficient estimate | Standard error | *p*-value |
|---|---|---|---|
| Intercept | 8.845 | 0.070 | <0.0001 |
| Log of number of transports | 0.730 | 0.007 | <0.0001 |
| Average trip time 31–60 minutes | 0.092 | 0.030 | 0.002 |
| Average trip time 61–90 minutes | 0.090 | 0.031 | 0.004 |
| Average trip time 91–120 minutes | 0.085 | 0.036 | 0.018 |
| Average trip time 121–150 minutes | 0.188 | 0.051 | 0.0002 |
| Average trip time > 150 minutes | 0.202 | 0.059 | 0.0007 |
| Share of ambulance hours worked that are volunteer | –0.005 | 0.0003 | <0.0001 |
| Share of revenue that is from local taxes | 0.005 | 0.0004 | <0.0001 |
| Share of transports that are nonemergency | –0.004 | 0.0003 | <0.0001 |
| Organization is nonprofit | 0.098 | 0.031 | 0.002 |
| Organization is government owned | 0.381 | 0.029 | <0.0001 |
| Rural service area | –0.157 | 0.023 | <0.0001 |
| Super-rural service area | –0.016 | 0.028 | 0.556 |
| Organization participates in standby events | 0.097 | 0.025 | <0.0001 |
| Log of organization's PE GPCI | 0.772 | 0.121 | <0.0001 |
| Uses dynamic staffing model | –0.190 | 0.024 | <0.0001 |
| Uses hybrid (dynamic and static) staffing model | –0.143 | 0.025 | <0.0001 |

Note: PE GPCI (practice expense geographic practice cost index). The coefficients for the response-time categories indicate the effect on costs relative to the lowest response-time category. The coefficients for the nonprofit and government-owned organizations indicate the effect on costs relative to for-profit organizations. The coefficients for rural and super-rural service areas indicate the effect on costs relative to an urban service area. The coefficients for dynamic and hybrid staffing models indicate the effect on costs relative to organizations that use a static staffing model. The $R^2$ = .75. Statistical testing indicated that multicollinearity is not an issue in this model. We used organization-level survey weights provided in the Ground Ambulance Data Collection System dataset to produce nationally representative results. The cost data used in this regression were deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

## Comparing organization revenues with their costs

MedPAC typically uses a comparison of health care providers' revenues and costs, when the data are available, to evaluate the adequacy of Medicare payments in various health care sectors. Although we use the GADCS data to conduct such an analysis in this report, this comparison of revenue with cost should be viewed cautiously for two reasons:

- Over half the ground ambulance organizations (55 percent) are government owned, and over half the total revenue (52 percent) for the government organizations comes from sources that are unrelated to the billing for ground ambulance services, such as funding from local governments, grants, and charitable donations. In addition, government organizations have higher average service intensity than for-profit and nonprofit organizations. Consequently, government organizations generally operate in a different financial context from other organizations.
- The GADCS data collection is the first time many ground ambulance organizations have submitted

## Regression analysis of relationship between ground ambulance costs and factors that could be used to adjust ambulance fee schedule payments

In the future, the data in the Ground Ambulance Data Collection System (GADCS) could be used in a regression analysis to inform how Medicare payments for ground ambulance services should be adjusted for the relevant factors that affect the cost to ambulance organizations for providing these services. Variables like the number of transports provided by the organization in a typical year; whether the organization primarily serves an urban, rural, or super-rural area; a measure that accounts for geographic differences in costs; and the intensity of the ambulance services provided by the organization are important factors in such an analysis.

We provide an example of a regression that could serve as the basis for adjusting payments for ground ambulance services. For this regression, we used the same dataset that we used for the regression in Table 6-8 (p. 271), which included data on 7,450 ground ambulance organizations. We used organization-level survey weights from the GADCS to produce nationally representative results. The dependent variable was the natural log of total costs of providing ground ambulance services for each organization. The explanatory variables included:

- the natural log of number of transports for all patients;
- whether the organization had an urban, rural, or super-rural service area;
- the natural log of the organization's practice expense geographic practice cost index (PE GPCI), which CMS uses to adjust payments to ground ambulance organizations for geographic differences in costs; and
- the share of the organization's transports that are in each of six billing codes for ground ambulance services that are included in the GADCS. These billing codes represent different levels of intensity for ambulance transports, and CMS adjusts payments depending on the code recorded on a claim.

Results from this regression indicate an $R^2 = 0.74$ and the following relationships between costs and these variables (Table 6-9):

- As an organization increases the number of transports, their costs increase at a slower rate, indicating economies of scale. For example, a 10 percent increase in the number of transports correlates with a 7.2 percent increase in costs.[12]
- Organizations that have rural service areas have lower costs than organizations that have urban service areas, holding constant the other factors used in this regression.
- A 10 percent increase in an organization's PE GPCI correlates with an 8.9 percent increase in costs.
- A 1 percentage point increase in the share of transports that are for basic life support (BLS) emergency transports increases costs by 0.5 percent.

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cost and revenue data, so there are likely some errors in reporting that should improve as these organizations gain experience reporting these data. CMS specifically mentioned that organizations may have made errors in reporting revenue from local government and other sources unrelated to billing for ground ambulance services (Buttorff et al. 2025). Reporting errors for these revenue sources have a larger effect on government organizations than other organizations.

## Regression analysis of relationship between ground ambulance costs and factors that could be used to adjust ambulance fee schedule payments (cont.)

- A 1 percentage point increase in the share of transports that are for advanced life support (ALS) nonemergency transports, ALS Level 1 emergency transports, ALS Level 2 transports, or specialty care transports increased costs from 1.2 percent to 1.3 percent.

The coefficient of 0.733 on the natural log of the number of transports is an important result. It suggests that as an organization increases the number of transports, its costs rise at a slower rate, which indicates economies of scale. Therefore, high-volume organizations have a financial advantage over low-volume organizations. ■

**TABLE 6–9**

**Regression results show that transport volume significantly affects ground ambulance costs, with larger organizations benefiting from economies of scale, 2022 and 2023**

| Variable | Coefficient estimate | Standard error | *p*-value |
|---|---|---|---|
| Intercept | 8.252 | 0.060 | <0.0001 |
| Log of number of transports | 0.733 | 0.006 | <0.0001 |
| Rural service area | –0.186 | 0.023 | <0.0001 |
| Super-rural service area | 0.002 | 0.028 | 0.9406 |
| Log of organization's PE GPCI | 0.895 | 0.126 | <0.0001 |
| Share of ambulance transports that are BLS, emergency | 0.005 | 0.0004 | <0.0001 |
| Share of ambulance transports that are ALS, nonemergency, Level 1 | 0.012 | 0.0009 | <0.0001 |
| Share of ambulance transports that are ALS, emergency, Level 1 | 0.013 | 0.0004 | <0.0001 |
| Share of ambulance transports that are ALS, Level 2 | 0.012 | 0.002 | <0.0001 |
| Share of ambulance transports that are specialty care transports | 0.013 | 0.002 | <0.0001 |

Note: PE GPCI (practice expense geographic practice cost index), BLS (basic life support), ALS (advanced life support). The coefficients for rural and super-rural service areas indicate the effect on costs relative to an urban service area. The coefficients on the share of transports in each of the service categories indicate the effect on costs of increasing the share in that category by 1 percentage point and decreasing the share for BLS nonemergency transports by 1 percentage point. The $R^2$ = .74. We used organization-level survey weights provided in the Ground Ambulance Data Collection System dataset to produce nationally representative results. The cost data used in this regression were deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

Taken together, these considerations lead us to view government ambulance organizations as operating in a different financial context from other ambulance organizations. In addition, we have found that some organizations reported extremely large differences between their revenues and costs, which may reflect this year being the first in which many organizations submitted these data. These data issues suggest that GADCS-based measures of ambulance organizations' revenues relative to costs might not be reliable indicators of payment adequacy. To improve our confidence in these measures, after applying exclusions described in the methods above—including the exclusion of organizations with costs more than three standard deviations from the mean—we further limited the influence of outliers by dropping the 5 percent of

**TABLE 6–10**

**Revenues relative to costs, by type of ownership, 2022 and 2023**

| | Median total revenue-to-cost ratio for ambulance services | |
|---|---|---|
| **Ownership category** | **Weighted by number of transports** | **Unweighted** |
| For profit | 1.11 | 1.03 |
| Nonprofit | 1.02 | 0.88 |
| Government | 0.98 | 0.72 |

Note: In all cells, the measures are calculated as revenues divided by costs. The revenues are from all sources, and costs are from ambulance transports for all patients. We used organization-level survey weights provided in the Ground Ambulance Data Collection System dataset to produce nationally representative results. The reported values are medians for each ownership category. All dollar values have been deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Medicare Ground Ambulance Data Collection System.

organizations with the largest negative differences and the 5 percent with the largest positive differences. This process yielded a trimmed analytic sample of 6,688 organizations.

Due to our concerns about the differences between government organizations and other organizations, we present two analyses of revenue relative to cost. The first analysis includes all 6,688 organizations in the trimmed analytic sample, and we report results separately for government, nonprofit, and for-profit organizations. The second analysis excludes from the trimmed 6,688 organizations the 3,721 government organizations, leaving 2,967 organizations. We used the data for the remaining 2,967 organizations to examine revenue relative to cost across several organizational characteristics, including whether the service area is urban, rural, or super rural; the number of transports; and the share of transports that are nonemergency.

In both analyses, we measure the ratio of revenue to cost for each ambulance organization. "Revenue" reflects the total revenues that the organization received from all sources, and "cost" reflects the total costs of providing ground ambulance services. We caution that these results should not be interpreted as Medicare margins because the revenue includes sources beyond FFS Medicare and the costs reflect ambulance services provided to all patients, not just FFS Medicare beneficiaries. Also, in both analyses, we calculated two median revenue-to-cost ratios (RCRs) for each category of ambulance organization. For the first RCR, we weighted each organization by the number of transports. The result is the RCR for the median transport. Half of the transports were in organizations that had higher RCRs and half were in organizations that had lower RCRs. For the second RCR, we did not weight the organizations by number of transports. The result is the RCR for the median organization. Half of the organizations had higher RCRs and half had lower RCRs.[13]

In the first analysis, we found a median weighted RCR of 0.98 for government organizations, which was lower than corresponding ratios for nonprofit and for-profit organizations (1.02 and 1.11, respectively) (Table 6-10). The government organizations also had a lower unweighted median ratio (0.72) than nonprofit and for-profit organizations (0.88 and 1.03, respectively). The RCRs vary widely within these categories. For example, among the government organizations, the RCR was 0.34 at the 25th percentile and 1.31 at the 75th percentile.

In the second analysis, which excluded government organizations, we found large differences in median weighted RCRs between low-volume and high-volume organizations. Organizations in the lowest quartile of transports had a median weighted RCR of 0.77, while those in the highest quartile had a median weighted

**TABLE 6–11**

**Ratio of revenue to cost was much lower for low-volume organizations than for high-volume organizations, 2022 and 2023**

| | Median total revenue-to-cost ratio for ambulance services | |
|---|---|---|
| **Group** | **Weighted by number of transports** | **Unweighted** |
| Service area location | | |
| Urban | 1.10 | 1.01 |
| Rural | 1.02 | 0.90 |
| Super rural | 1.03 | 0.90 |
| Quartile of transports | | |
| Lowest quartile | 0.77 | 0.77 |
| Second quartile | 0.86 | 0.84 |
| Third quartile | 0.98 | 0.97 |
| Highest quartile | 1.10 | 1.04 |
| Share of transports that were nonemergency | | |
| <0.25 | 1.08 | 0.94 |
| 0.25–0.50 | 1.10 | 0.96 |
| 0.50–0.75 | 1.10 | 0.98 |
| >0.75 | 1.10 | 1.02 |

Note: The reported value in each cell is the median. In all cells, the measures are calculated as revenues divided by costs. The revenues are from all sources, and costs are from ambulance transports for all patients. We used organization-level survey weights provided in the Ground Ambulance Data Collection System dataset to produce nationally representative results. All dollar values have been deflated to 2022 levels using the Consumer Price Index for All Urban Consumers.

Source: MedPAC analysis of data from the Ground Ambulance Data Collection System.

ratio of 1.10 (Table 6-11). This relationship between quartile of transports and revenue-to-cost ratio is another indication of economies of scale.

We found smaller differences when we grouped the organizations by service area location and by share of transports that were nonemergency. Organizations with urban service areas had a higher median weighted RCR of 1.10 compared with rural and super-rural organizations (1.02 and 1.03, respectively). However, all of these categories had median RCRs greater than 1.0, indicating that revenues were higher than costs for the median transports. We also found that there was not much difference in ratios between organizations that had a low share of transports that were nonemergency and those that had a high share of transports that were nonemergency.

In addition to comparisons of cost and revenue, the Commission also uses measures of beneficiary access to care, provider quality, and provider access to capital to assess payment adequacy in Medicare's FFS payment systems. Though we are not aware of data on the quality of ambulance services or on ambulance organizations' access to capital, analysis of measures of access to ambulance services could be part of future work, such as differences in average response times between geographic areas and whether residents in some geographic areas are farther from an ambulance organization than others.[14] A study of "ambulance deserts" (defined as census blocks in which the center is more than a 25-minute trip from an ambulance station) in 41 states suggested that access to ambulance services is limited in some areas. This study found that in 2021, 7.2 percent of the population in these states

(4.5 million people) lived in ambulance deserts (Jonk et al. 2023). Residents of rural counties were more likely to live in ambulance deserts than residents of urban counties (9.3 percent vs. 3.5 percent).

## CMS should continue to collect GADCS data, streamlined to reduce burden

The current AFS largely is not based on cost or revenue data. Instead, it was established in 2002, predominantly based on negotiated rulemaking and not on data that allowed for the identification of factors that affect the variation in ambulance costs. Moreover, the RVUs used to adjust AFS payments for differences in service intensity have not changed since 2002, and the adjustments for whether an ambulance transport occurred in an urban, rural, or super-rural location have not changed since 2008. Finally, before the GADCS, there was no comprehensive dataset that could be used to assess the adequacy of the AFS payment rates.

The GADCS is a good first step toward a dataset that policymakers can use to effectively evaluate the adequacy of AFS payments. As ambulance organizations become experienced with collecting and submitting data to CMS, the GADCS should be sufficient to allow analysts to evaluate whether aggregate AFS payments are large enough to ensure patient access and the accuracy of AFS payments across patient severity levels or geographic locations. In interviews and correspondence, stakeholders including ambulance organizations, CMS, RAND, and trade associations expressed support for continued collection of GADCS data. In addition, they indicated that collection of the data should continue in order to ensure that reliable data are available to maintain AFS payments that accurately reflect the cost of providing ambulance services to FFS Medicare beneficiaries. Also, for many organizations, the GADCS data collection was the first time they collected and submitted cost and revenue data, so there are likely errors in the data. With continued data collection, the quality of the data the organizations submit would improve. However, there is strong support among the stakeholders to reduce the burden of data collection by streamlining the GADCS.

### RECOMMENDATION 6

**The Congress should direct the Secretary to continue collecting cost and revenue data from suppliers and providers of ground ambulance services.**

- **Data collection should focus on information essential to assessing both the accuracy of Medicare payments and Medicare beneficiaries' access to care; and**
- **The Secretary should pursue opportunities to streamline data collection to minimize burden on suppliers and providers.**

### RATIONALE 6

The GADCS dataset represents an improvement over prior datasets used to evaluate AFS payments. However, the GADCS data-collection effort marked the first time that most ambulance organizations submitted cost and revenue data to CMS, so there are likely some reporting errors in the dataset. For example, CMS has expressed concerns that organizations may have made errors in reporting revenue from sources such as local government funding that are unrelated to billing for ground ambulance services as well as payments from FFS Medicare. Over time, as ambulance organization reporting improves, the dataset will become more useful in analyzing whether AFS payments are adequate to ensure beneficiaries' access to ground ambulance services and to determine how payments should vary with the costs of caring for beneficiaries with different needs across different locations.

Keeping the possibility of data-reporting errors in mind, we used the GADCS to examine the factors that affect the costs of providing ground ambulance services and found evidence that some payment adjusters in the current payment system may not be well targeted. For example, adjustments based solely on whether a service originates in an urban, rural, or super-rural area may not adequately direct payments to providers with the highest cost per transport. An adjustment for low-volume organizations operating in isolated areas could do a better job of targeting payments to organizations with high costs due to a lack of economies of scale. This finding is consistent with our June 2013 recommendation and with prior analyses by GAO (Government Accountability Office 2012, Government Accountability Office 2007).

The GADCS could be improved by streamlining the data elements and data-collection process. We found that the GADCS includes more variables than are necessary to assess average costs or beneficiaries' access to care, a concern that was emphasized by several stakeholders we interviewed. Many interviewees also reported that the volume of data collected was overly burdensome for some ambulance organizations.

CMS could ease this burden by simplifying how cost data are collected. Rather than requiring detailed reporting on the costs of each vehicle and facility, CMS could collect data on total costs for all vehicles and total costs for all facilities used by an organization. In addition, the GADCS currently includes data on 21 sources of revenue that are not related to billing for ambulance services. Many of these are very small sources of revenue, and these smaller sources could be combined into a single variable. CMS could also eliminate variables that are less critical to evaluating costs and access, such as whether the organization is the primary provider in its service area, whether the organization has a secondary service area (with several related questions), and the hours that ambulance personnel spend on nonambulance responsibilities.

Variables that should be retained include the number of transports and responses; response time; miles traveled by ambulances; measures of transport intensity; labor costs by type of personnel; total vehicle, equipment, supply, and facility costs; other costs such as billing services; ownership type (for profit, nonprofit, government owned); service area location (urban, rural, super rural); ambulance service revenue by type of payer (FFS Medicare, Medicare Advantage, Medicaid, commercial insurance, Veterans Administration, workers' compensation, and patient self-pay); revenue from sources not related to billing for ambulance services; and the ambulance organizations' uncompensated care and bad debt. CMS should determine whether to retain other variables that could be important measures of access to ambulance services. We note that reported average response time could be a useful measure of access to ambulance services, but many organizations did not provide an answer. We encourage CMS to work with ambulance organizations to improve their response rate to this question.

CMS could further ease the burden on organizations by requiring them to submit the GADCS data less frequently than every year. CMS could field the GADCS less frequently or use rotating panels (organizations would be grouped into panels, with panels alternating so that only one panel would collect and submit data each year).

## IMPLICATIONS 6

### Spending

- This recommendation would not affect program spending relative to current law.

### Beneficiaries and providers

- We do not expect this recommendation to have any adverse effect on beneficiaries' access to ground ambulance services. We do not expect that the recommendation will affect organizations' willingness or ability to provide these services. ■

## Endnotes

1 Ambulance services are part of a Part A benefit when the patient experiences an event during an inpatient stay that requires ambulance services to another facility.

2 There are some exceptions to this definition of a transport, such as when the patient dies during the transport.

3 In federal regulations under 42 CFR 414.605, BLS is defined as transportation by ground ambulance vehicle and medically necessary supplies and services, plus the provision of BLS ambulance services. The ambulance must be staffed by at least two people who meet the requirements of state and local laws where the services are being furnished. Also, at least one of the staff members must be certified, at a minimum, as an emergency medical technician-basic by the state or local authority where the services are furnished and be legally authorized to operate all lifesaving and life-sustaining equipment on board the vehicle. These laws may vary from state to state. Advanced life support Level 1 (ALS1) is transportation by ground ambulance vehicle, medically necessary supplies and services, and either an ALS assessment by ALS personnel or the provision of at least one ALS intervention. An ALS assessment is an assessment performed by an ALS crew as part of an emergency response that was necessary because the patient's reported condition at the time of dispatch was such that only an ALS crew was qualified to perform the assessment. An ALS assessment does not necessarily result in a determination that the patient requires an ALS level of service. An ALS intervention is a procedure that is, in accordance with state and local laws, required to be furnished by ALS personnel. Advanced life support Level 2 (ALS2) is either transportation by ground ambulance vehicle, medically necessary supplies and services, and the administration of at least three medications by intravenous push/bolus or by continuous infusion, excluding crystalloid, hypotonic, isotonic, and hypertonic solutions (dextrose, normal saline, Ringer's lactate); or transportation, medically necessary supplies and services, and the provision of at least one of several ALS procedures such as chest decompression. SCT is interfacility transportation of a critically injured or ill beneficiary by a ground ambulance vehicle, including medically necessary supplies and services, at a level of service beyond the scope of an EMT-paramedic. SCT is necessary when a beneficiary's condition requires ongoing care that must be furnished by one or more health professionals in an appropriate specialty area, for example, nursing, emergency medicine, respiratory care, cardiovascular care, or a paramedic with additional training.

4 CMS uses the CPI-U for the 12-month period ending with June of the previous year, and the multifactor productivity adjustment is a 10-year moving average of changes in annual economy-wide private nonfarm business multifactor productivity.

5 Under the AFS, CMS defines rural areas as ZIP codes outside of metropolitan statistical areas (MSAs) or in a rural census tract within an MSA; super-rural areas as ZIP codes located in rural counties that are among the lowest quartile of all rural counties by population density; and urban areas as ZIP codes in MSAs modified to exclude rural census tracts in MSAs. MSAs are defined at the county level, whereas census tracts are subdivisions of a county. Rural census tracts in MSAs generally have lower population density and limited commuting flow to the urban center of the MSA.

6 CMS created the survey weights so that empirical results reflect the full set of organizations from the four survey cohorts used to develop the GADCS. Using information for all 10,581 Year 1 through Year 4 organizations, CMS estimated a regression model expressing the likelihood of an organization's participation in the GADCS. The explanatory variables used by CMS included urbanicity, state, provider versus supplier status, and ownership type at the time of sampling; whether the organization had any paid FFS Medicare claims in each year from 2017 through 2022; the organization's FFS Medicare transport volume in 2023; the percentage of the organization's FFS Medicare claims that were to or from a dialysis center in 2023; and the percentage of the organization's FFS Medicare claims that were for emergent transports in 2023. CMS used the estimated coefficients from this model to predict the probability of GADCS participation for each organization and defined organization-level weights equal to the inverse of this probability.

7 "Trip time" is the time from when an ambulance begins a response to a call for service to when the same ambulance is ready to respond to another call.

8 We considered including share of labor hours that reflect different types of emergency personnel, such as emergency medical responders, emergency medical technicians, or paramedics, but inclusion of those variables caused collinearity issues.

9 Log-transforming the skewed cost data created a distribution that approximates a normal, bell-shaped distribution.

10 To calculate the effect of a 10 percent increase in transports on an organization's costs, we used the formula $(1.10)^{0.73} = 1.07$.

11 To calculate the effect of having a rural location on an organization's costs, we used the formula $\exp(-0.157) - 1 = -0.15$.

12 To calculate the effect of a 10 percent increase in transports on an organization's costs, we used the formula $(1.10)^{0.733} = 1.0724$.

13 For both the unweighted and weighted results, we first weighted by the sampling weights in the GADCS.

14 Section 50203(b) of the BBA of 2018, which mandated that CMS collect data from ground ambulance organizations, did not specify that the data collection include quality data. The statute authorized the collection of cost, revenue, utilization, and other information as determined appropriate by the Secretary.

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