United States Government Accountability Office

Report to Congressional Committees

February 2020

MEDICARE

Information on Medicare-Dependent Hospitals

GAO-20-300

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GAO Highlights

Highlights of GAO-20-300, a report to congressional committees

Why GAO Did This Study

The MDH program was enacted in 1989, providing a financial benefit to some small, rural hospitals with high shares of Medicare patients. The original MDH program was established through statute for 3 years, and Congress has extended it on several occasions. The Bipartisan Budget Act of 2018 included a provision to extend the MDH program through 2022, as well as a provision for GAO to review the MDH program.

This report describes, among other things, the changes that occurred in the number of MDHs and selected metrics over time. GAO analyzed data submitted to CMS by hospitals from fiscal years 2011 through 2017—the most recent year for which consistent data were available at the time of GAO's analysis—among other CMS data. GAO also reviewed CMS regulations and other agency documents.

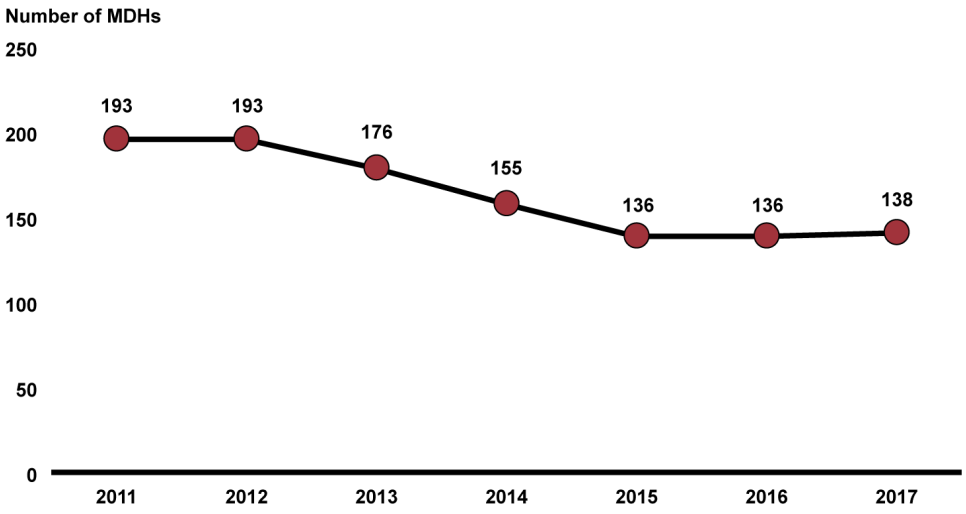
The Department of Health and Human Services provided technical comments on a draft of this report, which GAO incorporated as appropriate.

What GAO Found

The Centers for Medicare & Medicaid Services (CMS) operates the Medicare-dependent Hospital (MDH) program, which assists hospitals that have 60 percent or more of inpatient days or discharges from Medicare patients, 100 or fewer beds, and that are generally located in a rural area. MDHs receive an additional payment if their historic costs in one of three base years adjusted for inflation, among other things, are higher than what the hospital would have otherwise received under the inpatient prospective payment system (IPPS). In contrast, if the IPPS amount was higher than historic costs, the MDH would receive no additional payment. In fiscal year 2018, CMS paid approximately $119 million in additional payments to MDHs.

From fiscal years 2011 through 2017, the number of MDHs declined by around 28 percent. (See figure.) In addition, the number of MDHs that received an additional payment declined by around 15 percent.

Figure: Number of Medicare-Dependent Hospitals, Fiscal Years 2011 through 2017



Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

Over this period of time, MDHs also experienced a 13 percent decrease in the share of their Medicare revenue that came from inpatient services. In addition, there was a decline in the share of total MDH revenue that was attributed to Medicare patients, and a decline in Medicare profit margins by about 6 percentage points.

View GAO-20-300. For more information, contact Jessica Farb at (202) 512-7114 or farbj@gao.gov.

Contents

Tables

Figures

Abbreviations

CAH	critical access hospital
CMS	Centers for Medicare & Medicaid Services
IPPS	inpatient prospective payment system
HSR	hospital-specific rate
LVA	low-volume adjustment hospital
MCR	Medicare Cost Report
MDH	Medicare-dependent hospital
PSF	Provider Specific File
RRC	rural referral center
SCH	sole community hospital

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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February 28, 2020

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

The Honorable Frank Pallone
Chairman
The Honorable Greg Walden
Republican Leader
Committee on Energy and Commerce
House of Representatives

The Honorable Richard Neal
Chairman
The Honorable Kevin Brady
Ranking Member
Committee on Ways and Means
House of Representatives

In the 1980s, the Centers for Medicare & Medicaid Services (CMS) transitioned from paying hospitals based on their reported costs to implementing Medicare's inpatient prospective payment system (IPPS), which pays hospitals a set amount based on a beneficiary's diagnosis.[1] In mandating this transition, Congress's intent was to control Medicare costs by giving hospitals financial incentives to deliver services more efficiently and reduce unnecessary use of inpatient services by paying hospitals a predetermined amount. However, for some small rural hospitals, the Medicare payments they received under the IPPS were not sufficient to cover their reported costs for services provided to Medicare beneficiaries,

[1]In the 1980s, CMS was called the Health Care Financing Administration. The agency changed its name to CMS on July 31, 2001.

resulting in increased financial distress for these hospitals.[2] In response, Congress created rural payment designations that, among other things, can provide hospitals with additional payments on top of what CMS pays through the IPPS. There are currently five Medicare rural payment designations.

One such designation—the Medicare-dependent hospital (MDH) program—was created in 1989 as a temporary program providing a financial benefit for eligible hospitals—in general, small, rural hospitals with large shares of Medicare patients.[3] Congress has extended the program on several occasions, most recently through 2022.[4] To be eligible for the MDH program, hospitals must have at least 60 percent of inpatient days or discharges involving Medicare patients, have 100 or fewer beds, and be located in a rural area, though hospitals can also be eligible if they are located in a state without any rural areas and meet other specified criteria.[5] Some, though not all, MDHs receive additional payment above what they are paid under the IPPS. CMS determines the amount of these additional MDH payments using each hospital's historical

[2]We previously reported that, between 1985 and 1988, approximately 5 percent of rural hospitals closed, possibly due to financial distress under the new IPPS payment structure. We published a series of products on the increase in rural hospital closures during the late 1980s: GAO, *Rural Hospitals: Federal Efforts Should Target Areas Where Closures Would Threaten Access to Care*, GAO/HRD-91-41 (Washington, D.C.: Feb. 15, 1991); *Rural Hospitals: Factors That Affect Risk of Closure,* GAO/HRD-90-134 (Washington, D.C.: June 19, 1990); and *Rural Hospitals: Federal Leadership and Targeted Programs Needed,* GAO/HRD-90-67 (Washington, D.C.: June 12, 1990).

[3]Omnibus Budget Reconciliation Act of 1989, Pub. L. No. 101-239, § 6003(f), 103 Stat. 2106, 2144 (codified as amended at 42 U.S.C. § 1395ww(d)(5)(G)). For the purposes of this report, we refer to Medicare-dependent, small rural hospitals as Medicare-dependent hospitals (MDH). The original MDH program was established through statute for 3 years, and Congress has extended it on several occasions.

[4]The Bipartisan Budget Act of 2018 extended the MDH program through fiscal year 2022. Pub. L. No. 115-123, § 50205, 132 Stat. 64, 182 (codified as amended at 42 U.S.C. § 1395ww(d)(5)(G)).

[5]See 42 C.F.R. § 412.108 (2019). As of January 1, 2018, hospitals that are located in an urban state with no rural areas may be eligible for the MDH program if they otherwise meet criteria to reclassify as rural. CMS defines rural areas as those outside urban areas. CMS defines urban areas as metropolitan statistical areas—core-based statistical areas that have at least one urbanized area with a population of 50,000 or more, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. According to CMS, as of November 2019, Delaware, New Jersey, Rhode Island, and the District of Columbia did not have any rural areas.

cost data. In fiscal year 2018, CMS estimated that the MDH program paid approximately $119 million in additional payments to MDHs.[6]

The Bipartisan Budget Act of 2018 included a provision for us to review MDH program criteria. This report describes

1. how the MDH designation differs from the other rural hospital designations; and
2. the extent to which the number of MDHs and other select MDH metrics have changed over time.

To describe how the MDH designation differs from the other rural hospital designations, we reviewed CMS documentation, such as CMS regulations that specify how payments are to be made under the designations and which hospitals are eligible to receive them. We also identified the number of rural hospitals that have each designation. To identify the universe of rural hospitals, we used the CMS IPPS Impact File.[7] We then used the Provider Specific File (PSF) to identify the number of hospitals that had each of the five rural payment designations and, where possible, calculated the median amounts of additional payment received under each designation using Medicare Cost Reports (MCR) in fiscal year 2017—the most recent year for which consistent data

[6]This figure was based on a projection made upon expiration of the temporary program. See 82 Fed. Reg. 37990, 38558 (Aug. 14, 2017).

[7]We define rural hospitals using the CMS MDH programmatic definition—that is, those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. CMS IPPS Impact Files are prepared in advance of the fiscal year in order to estimate the effects of payment policy change proposals.

were available at the time of our analysis.[8] We also interviewed relevant CMS officials and representatives from a non-generalizable set of stakeholder groups, such as groups that represent hospitals, health care providers, and beneficiaries. Additionally, we interviewed researchers in the field of rural health policy.[9]

To describe changes in the number and selected metrics of MDHs from fiscal year 2011 through 2017, we calculated the number of MDHs and the distribution of additional payments for MDHs in each year using CMS IPPS Impact Files, PSF, and MCR data. Using these data sources, we then calculated three standard industry financial and operational metrics for MDHs as compared to all rural hospitals and all hospitals in aggregate. The first metric is the median proportion of total Medicare payments—referred to as revenue—the hospitals received from providing inpatient and outpatient care to Medicare beneficiaries. The second metric is hospitals' profit margins—a profitability measure calculated as the amount of revenue the hospital received minus reported costs, divided by the amount of revenue received. We calculated profit margins specific to Medicare revenue and costs (Medicare profit margins) but also for revenue and costs beyond Medicare (total facility profit margins), including payments for treating non-Medicare (including privately insured) patients. We calculated Medicare and total facility profit margins at the hospital level using hospital-reported costs and revenues from the MCRs,

[8]The PSF contains information about Medicare providers, including hospitals, that affects Medicare payments. The MCR is submitted to CMS by hospitals each fiscal year and contains information such as facility characteristics, utilization data, and costs to provide services to Medicare beneficiaries and all patients. We excluded some hospitals from our analysis, such as Indian Health Service hospitals, which are federal hospitals that generally serve American Indians and Alaska Natives, due to the unique nature of these hospitals. We also excluded Maryland hospitals and hospitals under the Rural Hospital Payment Demonstration because they are not paid under the IPPS. In addition, we excluded hospitals that reported no or negative revenue in certain MCR fields and included some Lugar hospitals (hospitals that are geographically rural but deemed to be a part of an urban area). Because critical access hospitals (CAH) are paid based on cost under a different payment system than the other hospitals, we did not have complete data to estimate what those hospitals would have been paid under the inpatient prospective payment system and thus could not identify the additional payments received as a CAH. In addition, another of the designations—rural referral centers—only receive indirect payment benefits, and thus we could not calculate a comparable additional payment for that group of hospitals.

[9]Specifically, we interviewed seven stakeholder groups, including three representing hospitals, one representing providers, and one representing beneficiaries. We also interviewed six groups knowledgeable about the subject, including those with individuals who have published research in the area of rural hospitals. We identified stakeholder groups and researchers through articles relevant to rural hospital research as well as by asking interviewees for suggested groups and researchers.

and reported the median margins for each hospital group. Third, we calculated hospitals' degree of Medicare dependence using three separate definitions, or measures, of dependence: (1) the amount of revenue the hospital received from Medicare as a share of all the revenue the hospital received for inpatient and outpatient services (total care revenue), (2) the share of inpatient days of care the hospital provides that are attributed to Medicare beneficiaries, and (3) the share of inpatient discharges that are attributed to Medicare beneficiaries. We separately analyzed data for MDHs that were eligible for the MDH program based on data from the 1980s. We identified these MDHs using data from Medicare Administrative Contractors—third party entities that administer Medicare program payments.

We also used regression models to estimate the relationship between MDH program criteria and the three definitions of Medicare dependence using data from the MCR, PSF, and CMS IPPS Impact Files. We also separately estimated the relationship between total facility profit margin (without additional MDH payment) and MDH program criteria. Each model held certain hospital and market factors constant, including hospital ownership status, distance to the nearest 100-bed hospital, and percentage of population 65 and older. We assessed the reliability of each of the data sets we used for these analyses by interviewing CMS officials, reviewing related documentation, and performing data checks. On the basis of these steps, we concluded that the data were sufficiently reliable for the purposes of our reporting objectives. For more information on our methodology for the data analysis, see appendix I.

We conducted this performance audit from March 2019 to February 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Payment for Hospital Services under Medicare

Under traditional Medicare, hospitals are paid for the inpatient and outpatient services they provide under two distinct payment systems.

- Inpatient stays, including services incurred after being admitted to the hospital, are paid under the IPPS. Under this system, Medicare pays hospitals a flat fee per beneficiary stay, set in advance, with different

amounts generally based on the beneficiary's condition. Payment rates are also influenced by hospital-specific factors such as the relative hourly wage in the area where the hospital is located, and whether the hospital qualifies for other case- or hospital-specific additional payments.

- Outpatient services, including services obtained through the emergency department or other services incurred without being admitted to the hospital, are paid under the outpatient prospective payment system. Under this system, Medicare pays hospitals a flat fee per service, set in advance, with different amounts for each type of service. As with the IPPS, payment rates are adjusted for geographic factors.

Congress has established payment adjustments for certain hospitals under the IPPS by changing the qualifying criteria for IPPS payment categories, creating and extending exceptions to IPPS rules, or exempting certain types of hospitals from the IPPS. These adjustments may help ensure beneficiary access to care or to help hospitals recruit and retain physicians and other medical professionals.[10]

MDH Designation Eligibility Criteria

Created through the Omnibus Budget Reconciliation Act of 1989, the MDH designation is an example of how Congress can enhance payments to certain hospitals. To qualify as an MDH, a hospital must demonstrate that it is:

- Medicare-dependent, defined as having at least 60 percent of their inpatient days or discharges attributable to Medicare beneficiaries;
- small, defined as having 100 or fewer beds; and
- rural, defined as being located in a rural area, though hospitals can also be eligible if they are located in a state without any rural areas.[11]

CMS regulations provide that hospitals can meet the requirement of demonstrating a 60 percent Medicare share of days or discharges using two of the three most recently settled cost reports, or using cost reports

[10]We recently reported on the challenges that older adults in rural areas face seeking health care, among other things. See GAO, *Older Americans Act: HHS Could Help Rural Service Providers by Centralizing Information on Promising Practices,* GAO-19-330 (Washington, D.C.: May 23, 2019).

[11]See 42 U.S.C. § 1395ww(d)(5)(G)(iv); 42 C.F.R. § 412.108 (2019). The Bipartisan Budget Act of 2018 amended the law so that hospitals in all-urban states that otherwise meet the eligibility criteria could be designated as an MDH. In addition, hospitals must not be designated as a sole community hospital (SCH), one of the other four rural payment hospital designations, in order to qualify as an MDH.

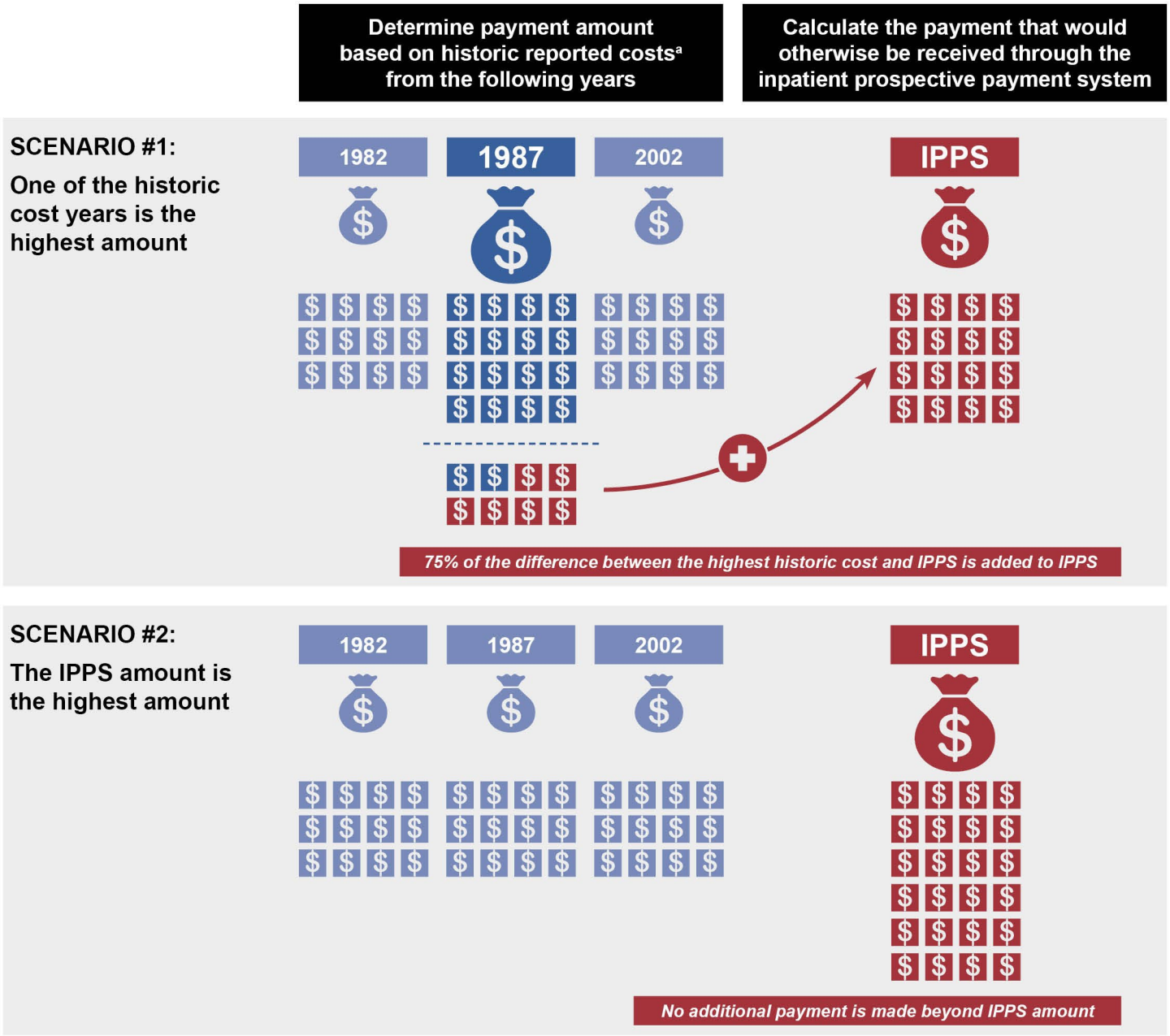
from 1987 or 1988. We refer to hospitals that meet this criterion using 1987 or 1988 cost report data as “legacy MDHs.”

MDH Designation Payment Criteria and Payment Methodology

Some, but not all, MDHs are eligible to receive additional payment each year if they meet the payment criterion. Specifically, MDHs are assigned a payment rate—known as the hospital-specific rate (HSR)—based on their historic reported inpatient operating costs, trended forward to adjust for inflation and other factors, from one of three years (1982, 1987, or 2002). If the payment based on the HSR is higher than what the MDH would have otherwise received under IPPS, the MDH receives an additional payment.[12] In this case, the MDH additional payment is calculated as 75 percent of the difference between the HSR and the IPPS amount. If the IPPS amount were higher than the HSR, the MDH would receive no additional payment. (See fig. 1.)

[12]To determine costs in each of the three years, CMS contractors calculate inpatient operating costs per discharge and adjust for case mix. These costs are also adjusted for budget neutrality purposes. When the MDH designation was created, 1982 and 1987 were established as base cost years. The Deficit Reduction Act of 2005 extended the program and established 2002 as a base cost year option beginning in fiscal year 2007. See Pub. L. No. 109-171, § 5003, 120 Stat. 4, 31 (2006). A HSR is also calculated for hospitals with an SCH designation based on historic reported inpatient costs from 1982, 1987, 1996, or 2006.

Figure 1: Annual Process Used by Centers for Medicare & Medicaid Services to Make Medicare-Dependent Hospital (MDH) Program Payments



Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) regulations. | GAO-20-300

Notes: Hospitals submit information to CMS on the costs they incur to provide care to patients, including Medicare patients, through Medicare Cost Reports (MCR).To determine costs in each of the three years for the purposes of determining a potential additional MDH payment, CMS contractors

calculate inpatient operating costs per discharge based on data provided through the MCR and adjust for case mix. These costs are also adjusted for budget neutrality purposes.

[a]Historic costs are trended forward to adjust for inflation and other factors.

Hospitals with an MDH designation are also eligible to receive other benefits. For example, MDHs are eligible for a separate additional payment if the hospital experiences at least a 5 percent decline in inpatient volume due to circumstances beyond its control.[13] The MDH program does not provide for additional payments for outpatient services.

The MDH Program Differs from Other Medicare Rural Hospital Payment Designations in Terms of Eligibility Criteria, Financial Benefit, Legislative Permanence, and Relative Size

In addition to the MDH designation, four other rural hospital designations exist: (1) critical access hospitals (CAH), (2) sole community hospitals (SCH), (3) low-volume adjustment hospitals (LVA), and (4) rural referral centers (RRC).[14] Our review of CMS documentation shows that the MDH payment designation differs from the other rural payment designations in terms of eligibility criteria, financial benefit, extent of legislative permanence, and size—that is, the number of hospitals receiving the designation. (For detailed information on the five rural payment designations, see app. II.)

Eligibility Criteria. The MDH designation differs from the other designations in terms of eligibility criteria. As noted earlier, MDHs must have at least 60 percent of their inpatient days or discharges attributed to Medicare patients, must be small and, with few exceptions, rural. In contrast, both the SCH and CAH designations require hospitals to be remote rural hospitals (i.e., located a specified distance from the nearest hospital).[15] Similarly, LVAs are generally required to be more than 15 miles from the nearest hospital. Rural hospital designations also differ in terms of eligibility criteria related to bed size. CAH-designated hospitals

[13]This particular benefit also applies to SCHs, another rural payment designation available through the Medicare program. See 42 C.F.R. § 412.92(e) (2019). MDHs are also exempt from the 12 percent limit on Medicare disproportionate share hospital payment adjustments, which are made for hospitals serving a significantly disproportionate number of low-income patients that apply to most other rural hospitals.

[14]Under the Medicare program, CAHs and acute care hospitals operate under distinct conditions of participation and payment systems. For purposes of this report, we consider the CAH designation to be one of the five rural hospital payment designations.

[15]For SCHs, CMS classifies a hospital based on its distance from other “like hospitals.” See 42 C.F.R. § 412.92(c)(2) (2019). A CAH generally must be more than a 35-mile drive from another hospital, more than a 15-mile drive from another hospital via mountainous or secondary roads, or must have been deemed a necessary provider prior to 2006. See 42 C.F.R. §§ 485.610, 485.620 (2019).

are required to have 25 inpatient beds or fewer, while MDHs must have 100 beds or fewer. RRCs must have at least 275 beds or meet other criteria, such as serving a high proportion of remote patients, among other things.

Financial Benefit. The MDH designation has a relatively small financial benefit compared to most of the other rural hospital designations, and the benefit only applies to costs associated with inpatient services. MDHs generally can only receive 75 percent of the difference between payment based on their HSR and the payment they would have otherwise received based on the IPPS rate as an additional payment added to their IPPS rate payment.[16] In contrast, the SCH and CAH designations have both inpatient and outpatient payment benefits. Hospitals with an SCH designation can receive an additional payment added to their IPPS rate payment equal to 100 percent of the difference between payment based on the HSR and what the hospital would otherwise receive as payment based on the IPPS rate, as well as a 7.1 percent addition to their outpatient payments.[17] The CAH designation results in the highest financial benefit by generally providing 101 percent of the hospital's reported costs in the current year for both inpatient and outpatient Medicare services. LVAs generally can receive up to 25 percent in additional payments, and while RRCs receive no direct financial benefit, they are exempt from certain requirements related to geographic reclassification (as are SCHs).

Legislative Permanence. Unlike all but one other rural payment designation, the MDH program is a temporary program and must be extended periodically by Congress in order to continue. Historically, the extension by Congress has sometimes occurred after the program has expired and as a result there were temporary lapses in payments to MDH designated hospitals. The Bipartisan Budget Act of 2018 included a provision to extend the MDH program through fiscal year 2022.[18] The only other designation that must be extended is the LVA designation. In 2010, the Patient Protection and Affordable Care Act temporarily expanded the

[16] MDH- and SCH-designated hospitals may also receive an additional payment if the hospital experiences a greater than 5 percent decline in inpatient volume due to circumstances beyond its control.

[17]Under the SCH program, the hospital-specific rate is based on base period years of 1982, 1987, 1996, or 2006.

[18]Pub. L. No. 115-123, § 50205, 132 Stat. 64, 182.

LVA designation eligibility criteria to include hospitals with a higher volume of discharges and located closer to other hospitals than in previous years.[19] These expanded eligibility criteria have been amended and extended through fiscal year 2022.[20] If Congress does not extend the expanded eligibility criteria beyond fiscal year 2022, the LVA designation will return to the narrower eligibility criteria that were in place prior to the Patient Protection and Affordable Care Act.

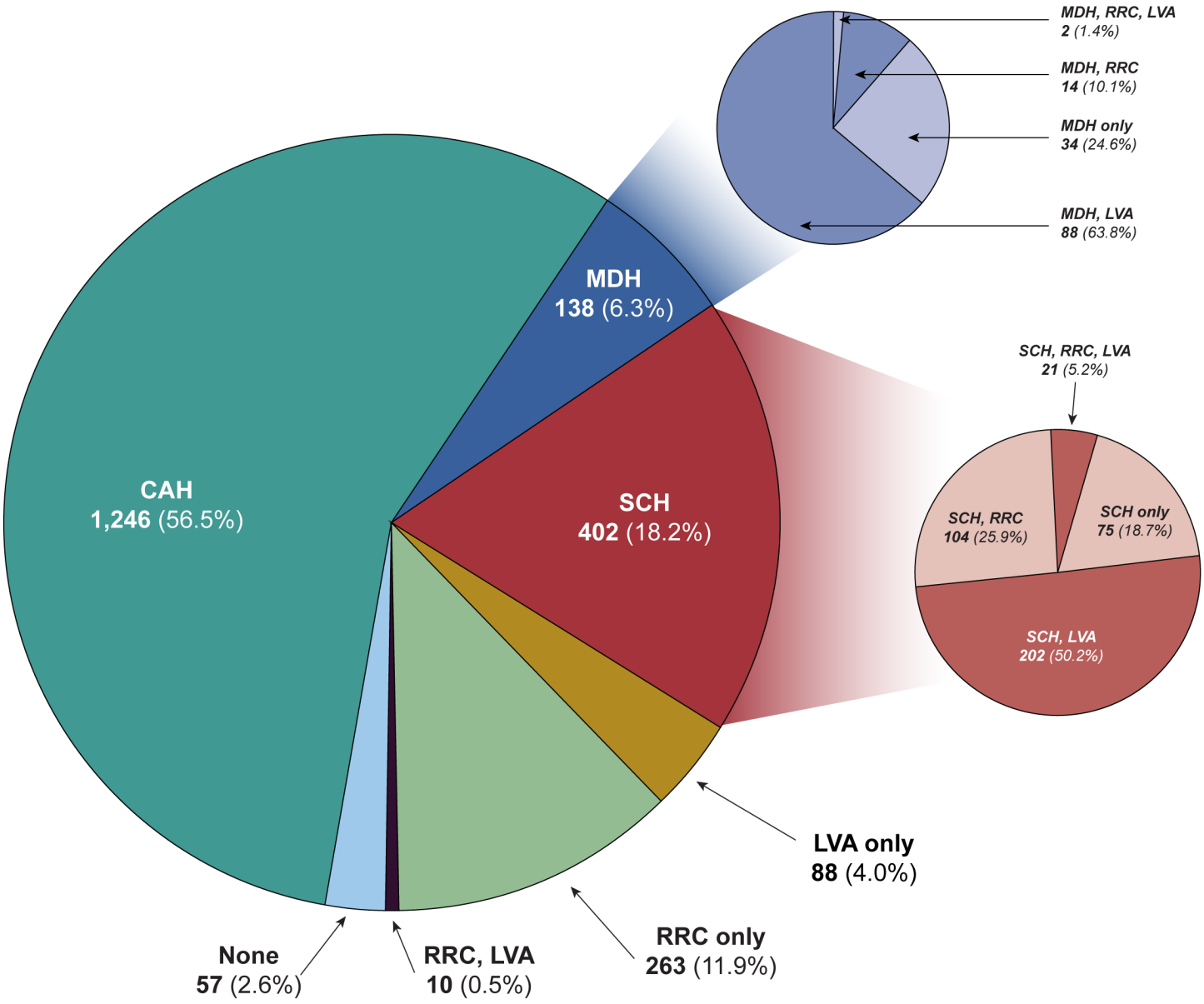
Relative size and overlap. Of the 2,204 rural hospitals in fiscal year 2017, a relatively small share of these hospitals were MDHs.[21] (See fig. 2.) In total, 138 hospitals, or 6.3 percent of those rural hospitals with at least one designation, were MDHs. In contrast, CAHs comprised the largest proportion of rural hospitals with a designation. In fiscal year 2017, 1,246 rural hospitals—or 56.5 percent of those rural hospitals with at least one designation—were CAHs. Of the five designations, three—CAHs, MDHs, and SCHs—are exclusive to each other, meaning a hospital can only have one of the three designations at any time. Hospitals designated as MDHs and SCHs may also be designated as LVAs, RRCs, or both. Approximately 75 percent of MDHs and 81 percent of SCHs had at least one concurrent designation in fiscal year 2017; in contrast, none of the CAHs received a secondary designation because CAHs are not eligible to receive other designations. Those MDHs with a concurrent designation consisted of 88 that had an LVA designation, 14 that had an RRC designation, and 2 that had both an LVA and RRC designation. (For detailed information on the 5 rural payment designations including LVA and RRC eligibility and financial benefit, see app. II.)

[19]Pub. L. No. 111-148, §§ 3125, 10314, 124 Stat. 119, 425, 944 (2010) (codified as amended at 42 U.S.C. § 1395ww(d)(12)(C)).

[20]For fiscal years 2019 through 2022, the LVA designation may apply to hospitals that have fewer than 3,800 total discharges and are located more than 15 road miles from another hospital. Under current law, the criteria narrow in fiscal year 2023 to require fewer than 800 total discharges and a distance of more than 25 road miles from another hospital. See 42 U.S.C. §§ 1395ww(d)(12)(C)(III)-(IV).

[21]This figure includes all hospitals considered rural by CMS for payment purposes.

Figure 2: Number of Rural Hospitals with Medicare Payment Designations, Fiscal Year 2017



Legend: CAH= critical access hospital; LVA= low-volume adjustment hospital; MDH= Medicare-dependent hospital; RRC= rural referral center; SCH= sole community hospital.

Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

The Number of MDHs Declined over Time, As Did the Inpatient Share of Medicare Revenue and Profit Margins

From fiscal years 2011 through 2017, the number of MDHs declined, as well as the number of MDHs that received an additional payment under the program. In addition, during this period MDHs varied on other operational and financial metrics, including the share of Medicare revenue coming from inpatient care, various measures of Medicare dependence, and profit margins.

From Fiscal Years 2011 through 2017, the Number of MDHs Declined by 28 Percent, and the Number of MDHs Receiving Additional Payments Decreased by 15 Percent

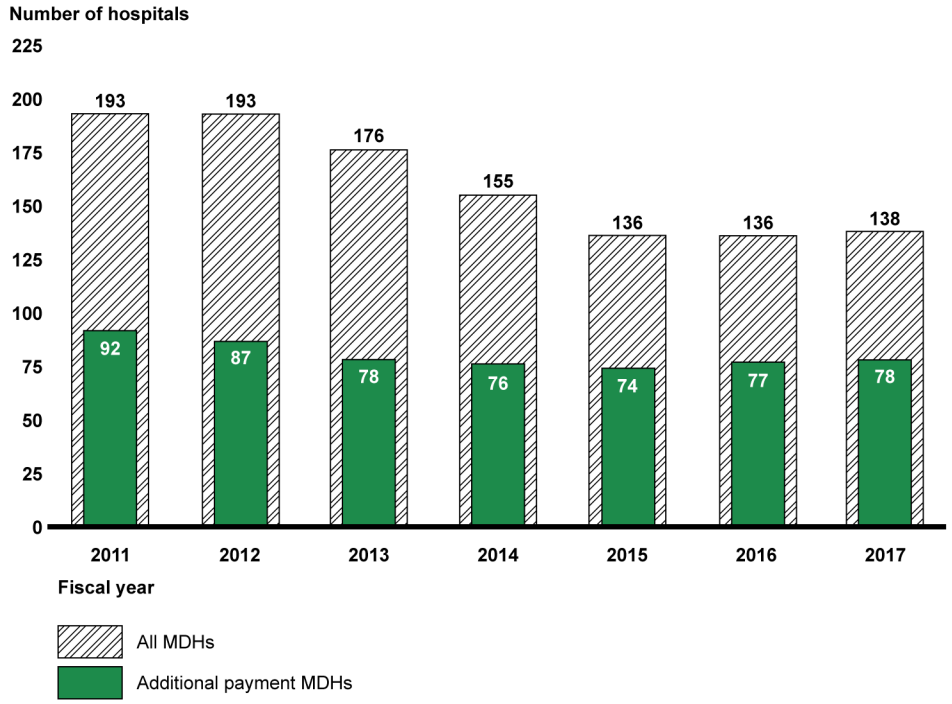
Our analysis of CMS data shows that the number of MDHs declined from 193 to 138—a 28 percent decrease over the 7-year period from fiscal year 2011 through fiscal year 2017.[22] (See fig. 3.) This decline can be due to a number of factors, including hospital closures, mergers, or changes in designation. For example, we previously reported that 16 MDHs closed between 2013 and 2017.[23] Moreover, our review of Medicare Administrative Contractor documentation found that some MDHs became ineligible for the program due to no longer meeting eligibility criteria. In addition, the number of MDHs that received an additional annual payment also declined, from 92 MDHs in fiscal year 2011 to 78 MDHs in fiscal year 2017—a 15 percent decrease.[24]

[22]We also examined these data specifically for legacy MDHs, or MDHs that were eligible for the program based on data from the 1980s. The number of legacy MDHs—few in number—also declined somewhat over time (37 in fiscal year 2011 to 24 in fiscal year 2017).

[23]See GAO, *Rural Hospital Closures: Number and Characteristics of Affected Hospitals and Contributing Factors,* GAO-18-634 (Washington, D.C.: Aug. 29, 2018).

[24]As previously noted, MDHs receive an annual payment in addition to what is received through the IPPS only if their historic reported costs—trended forward to adjust for inflation—from one of three years (1982, 1987, or 2002) are higher than what they would have received under the IPPS.

Figure 3: Number of Medicare-Dependent Hospitals (MDH) and MDHs with Additional Payment, Fiscal Years 2011 through 2017



Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

Notes: MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. This analysis included inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excluded hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program. MDHs receive additional Medicare payment when payment rates based on their reported historical costs (adjusted for inflation and other factors) from 1982, 1987, or 2002 exceed the payments based on the IPPS rate in a given year. When this occurs, MDHs receive 75 percent of the difference between the highest historical payment rate and the IPPS rate.

Among MDHs that received an additional payment, the amount received and the share of the hospital's total revenue this payment represented varied widely across the years, though the average amount generally

increased over time.[25] (See table 1.) For example, in fiscal year 2017, one hospital received around $1,000 in additional payment while another received almost $10.5 million. While the trend was not uniform among all MDHs, the median additional payment increased from about $695,000 in fiscal year 2011 to about $812,000 in fiscal year 2017.

Table 1: Distribution of Additional Payment Amounts for Medicare-Dependent Hospitals (MDH), Fiscal Years 2011 through 2017

In dollars

		2011	2012	2013	2014	2015	2016	2017
MDH additional payment Amount	Maximum	7,331,459	7,833,715	6,599,837	8,953,031	9,112,148	9,594,837	10,448,090
	Median	695,214	646,145	541,248	646,300	748,606	873,104	812,239
	Minimum	1,472	730	12,830	14,113	6,926	10,627	1,007

Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

Notes: MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. This analysis included inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excluded hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program. MDHs receive additional Medicare payment when payment rates based on their reported historical costs (adjusted for inflation and other factors) from 1982, 1987, or 2002 exceed the payments based on the IPPS rate in a given year. When this occurs, MDHs receive 75 percent of the difference between the highest historical payment rate and the IPPS rate.

Our analysis of CMS data also shows that the average additional payment MDHs received ranged from less than 0.1 percent up to 8.7 percent of total facility revenue, with a fairly consistent average of 1.2 to 1.6 percent. (See table 2.) This underscores that the additional payment under the MDH program can be small relative to the overall revenue that the hospital receives.

[25]The number of legacy MDHs that received additional payment also declined from 16 in fiscal year 2011 to 11 in fiscal year 2017. For those legacy MDHs that received an additional payment, average amounts were significantly lower than the overall MDH average additional payment. For example, in fiscal year 2017, the median additional payment amount was about $212,000 for legacy MDHs and about $910,000 for non-legacy MDHs.

Table 2: Additional Payments for Medicare-Dependent Hospitals (MDH) as a Share of Hospitals' Total Reported Revenue, Fiscal Years 2011 through 2017

In percent

		2011	2012	2013	2014	2015	2016	2017
MDH additional payment amount as share of hospitals' total reported revenue	Maximum	8.3	9.1	8.0	7.2	7.3	7.2	8.7
	Median	1.5	1.3	1.2	1.2	1.3	1.6	1.4
	Minimum	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1

Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

Notes: Total revenue is based on what hospitals reported to CMS through Medicare Cost Reports. MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. This analysis included inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excluded hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program. MDHs receive additional Medicare payment when payment rates based on their reported historical costs (adjusted for inflation and other factors) from 1982, 1987, or 2002 exceed the payments based on the IPPS rate in a given year. When this occurs, MDHs receive 75 percent of the difference between the highest historical payment rate and the IPPS rate.

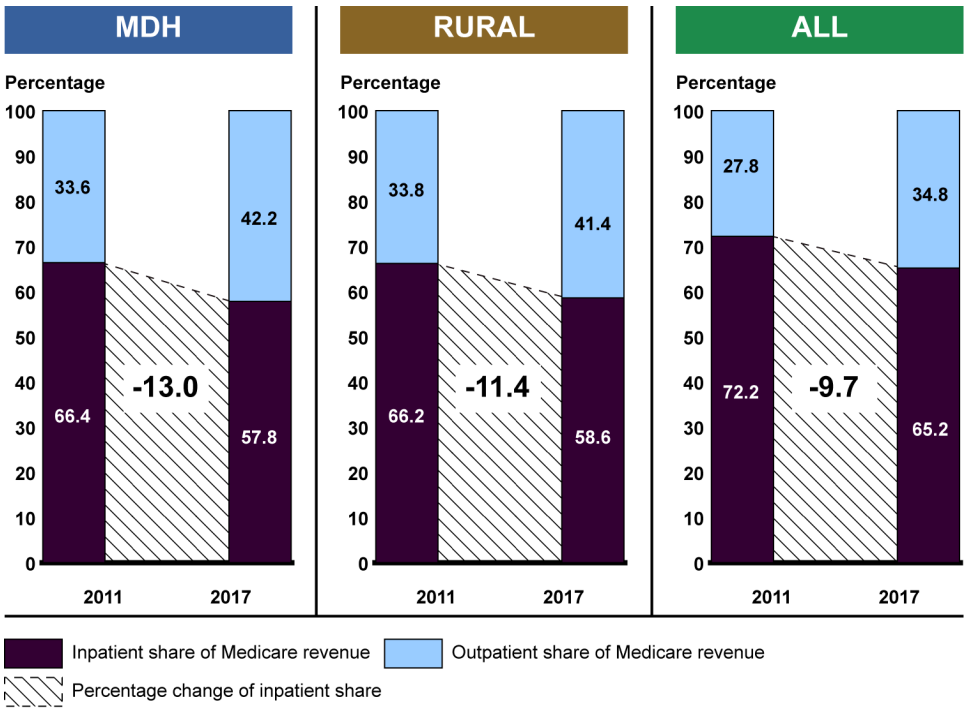
MDHs Varied over Time on Select Operational and Financial Metrics

Our analysis of CMS data also shows that from fiscal years 2011 through 2017, MDHs varied on selected operational and financial metrics: the mix of Medicare revenue that came from inpatient versus outpatient care, various measures of Medicare dependence, and profit margins.

Inpatient/Outpatient Mix

On average, MDHs experienced a decline in the share of Medicare revenue that came from inpatient services. (See fig. 4.) In fiscal year 2011, around 66 percent of MDH Medicare revenue came from inpatient services compared to 58 percent in fiscal year 2017—a 13 percent decrease. This trend was slightly greater than that for all rural hospitals (an 11 percent decrease) and all hospitals (a 10 percent decrease).

Figure 4: Inpatient and Outpatient Shares of Medicare Revenue for Medicare-Dependent Hospitals (MDH), All Rural Hospitals, and All Hospitals for Fiscal Years 2011 and 2017



Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

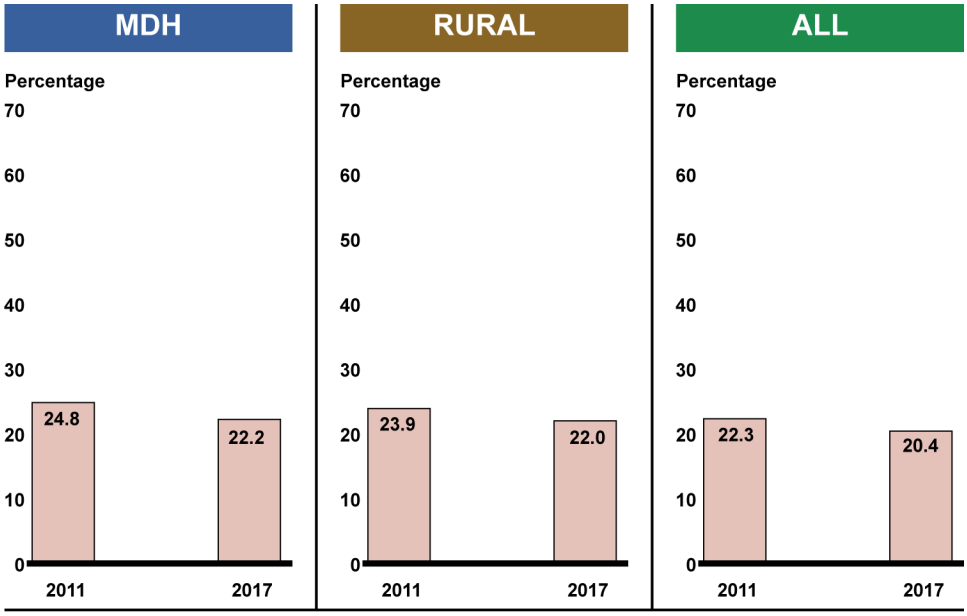
Notes: MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. Rural hospitals are defined as those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. Our all hospitals category includes inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excludes hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH or sole community hospital status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program.

Measures of Medicare Dependence

The trends across three measures of Medicare dependence varied for MDHs over time. Looking at the Medicare share of total revenue for MDHs, we found this share decreased when comparing fiscal years 2011 and 2017, from 25 to 22 percent.[26] (See fig. 5.)

[26]Other payors that make up the remaining share of a hospital's revenue and utilization include private payors and other government payors, such as Medicaid.

Figure 5: Median Medicare Share of Total Care Revenue for Medicare-Dependent Hospitals (MDH), All Rural Hospitals, and All Hospitals, Fiscal Years 2011 and 2017

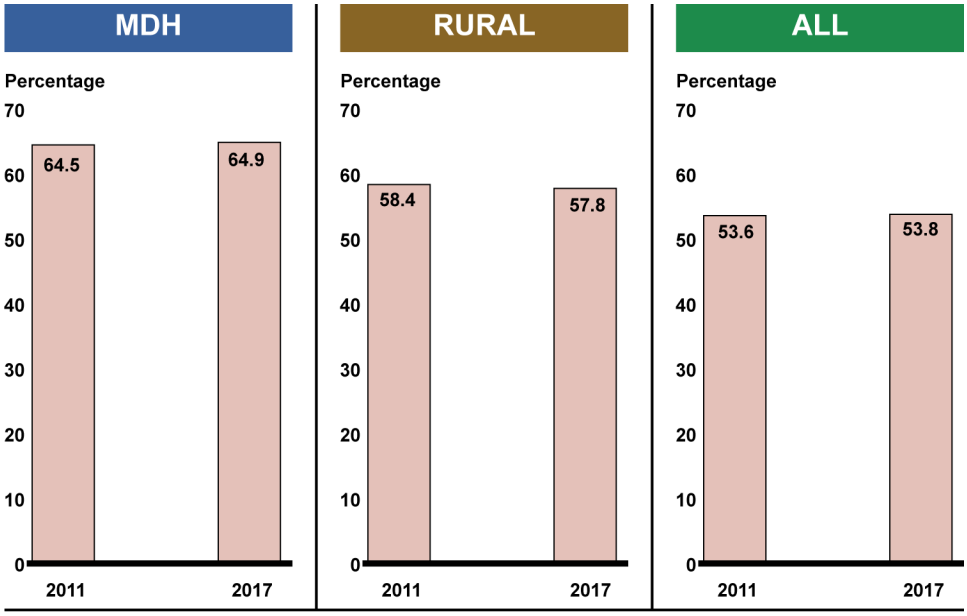


Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data | GAO-20-300

Notes: Total care revenue is the total amount of revenue the hospital received from inpatient and outpatient services. MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. Rural hospitals are defined as those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. Our all hospitals category includes inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excludes hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH or sole community hospital status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program.

In contrast, in terms of the number of inpatient days and discharges attributable to Medicare beneficiaries, we found these measures both increased slightly over time. Specifically, the median share of MDH inpatient days attributable to Medicare beneficiaries increased, although by less than a percentage point, and the median Medicare share of inpatient discharges increased by about 2 percentage points, when comparing fiscal years 2011 and 2017. (See figures 6 and 7.)

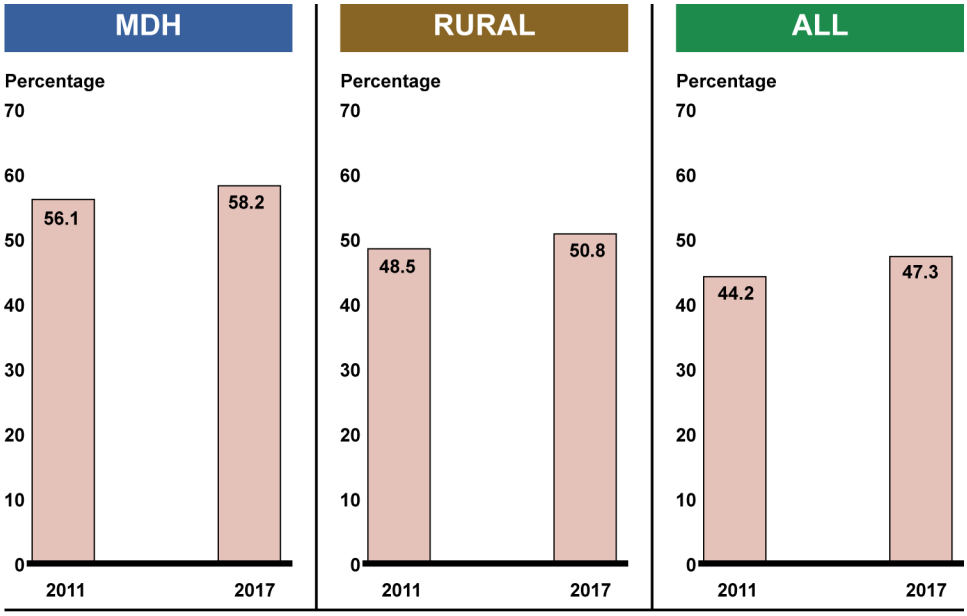
Figure 6: Median Medicare Share of Inpatient Days for Medicare-Dependent Hospitals (MDH), All Rural Hospitals, and All Hospitals, Fiscal Years 2011 and 2017



Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data | GAO-20-300

Notes: The Medicare share of inpatient days is the proportion of inpatient bed days attributed to Medicare patients. MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. Rural hospitals are defined as those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. Our all hospital category includes inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excludes hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH or sole community hospital status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program.

Figure 7: Median Medicare Share of Inpatient Discharges for Medicare-Dependent Hospitals (MDH), All Rural Hospitals, and All Hospitals, Fiscal Years 2011 and 2017



Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data | GAO-20-300

Notes: The Medicare share of inpatient discharges is the proportion of inpatient discharges attributed to Medicare patients. MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. Rural hospitals are defined as those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. Our all hospitals category includes inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excludes hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH or sole community hospital status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program.

To obtain additional context on the relationship between MDH eligibility criteria and the various measures of Medicare dependence, we ran regression models to identify the extent to which hospitals' bed size and rural status were associated with the Medicare share of days, discharges, and total care revenue for all hospitals from fiscal years 2011 through 2017. We found that rural hospitals with fewer beds were associated with higher Medicare shares of inpatient days and discharges, holding all other

factors constant. [27] This indicates that by targeting smaller, rural hospitals in its eligibility criteria, the MDH program is targeting hospitals that are Medicare-dependent defined in terms of inpatient volume. At the same time, rural hospitals with fewer beds generally received a smaller share of their total care revenue from Medicare compared with other hospitals. This suggests that hospitals associated with high Medicare inpatient volume may not have relatively high shares of total care revenue coming from Medicare. For more technical detail on our regression analyses and findings, see appendix III.

Profit Margins

Our analysis of self-reported data from hospitals shows that Medicare profit margins and total facility profit margins declined for MDHs from fiscal year 2011 through 2017. (See table 3.) The degree to which Medicare margins declined for MDHs during this time period (6 percentage points) was greater than the degree to which they declined for rural hospitals (4 percentage points) and all hospitals (3 percentage points).[28] The self-reported data show that unlike rural and all hospitals, MDHs were not profitable in 2017—meaning that the revenue they received from Medicare and other payers was less than their reported costs for providing services. Specifically, the total facility profit margin turned from positive to negative and dropped almost two percentage points between fiscal years 2011 and 2017.[29]

Table 3: Median Profit Margins for Medicare-Dependent Hospitals (MDH), All Rural Hospitals, and All Hospitals, Fiscal Years 2011 through 2017

In percent

	2011	2017	Percentage point change
MDH Medicare margin	-6.9	-12.9	-6.0
Rural hospitals Medicare margin	-4.8	-8.5	-3.8
All hospitals Medicare margin	-5.5	-8.0	-2.5
MDH total facility margin	1.6	-0.2	-1.8

[27]In all of our regression models, we control for certain hospital and market characteristics, such as ownership type and the percent of individuals aged 65 or older in the county. For more detail on the regression methodology and findings, see app. I and III.

[28]Between fiscal years 2011 and 2017, the profit margins for legacy MDHs decreased from -6.9 percent to -8.6 percent.

[29]Between fiscal years 2011 through 2017, legacy MDH's total facility margin decreased from 1.7 percent to -0.5 percent.

	2011	2017	Percentage point change
Rural hospitals total facility margin	3.1	2.8	-0.3
All hospitals total facility margin	3.6	4.5	0.9

Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

Notes: Medicare profit margins are defined as Medicare payments minus Medicare costs, divided by Medicare payments. Total facility profit margins are defined as total facility payments minus total facility costs, divided by total facility payments. We calculated Medicare-specific and total facility profit margins at the hospital level using hospital-reported costs and revenues from the Medicare cost reports, and reported the median margins for each hospital group. The Medicare margin reflects only payments and costs received for inpatient and outpatient services and excludes payments and costs for other hospital-based services, such as those for skilled nursing and home health care. MDHs were identified by the designation listed in the CMS Provider Specific File on the record with the most recent effective date in a given fiscal year. Rural hospitals are defined as those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. Our all hospitals category includes inpatient prospective payment system (IPPS) hospitals—hospitals that receive payment for inpatient services under traditional Medicare based on prospectively set payment rates—within the 50 states and the District of Columbia, with the exception of Maryland due to its unique hospital payment model. This analysis excludes hospitals with cost report data that had questionable reliability, those that submitted cost reports for periods of time less than 10 months or greater than 14 months, hospitals with partial-year MDH or sole community hospital status, Indian Health Service hospitals, and those participating in the Rural Community Hospital Demonstration program.

We also ran regression models to examine the relationship between all hospitals' total profit margins and the various measures of Medicare dependence. We found that hospitals with a higher Medicare share of total-care revenue had lower total facility margins on average, holding all other factors constant; in contrast, there was no significant relationship between total facility margins and the inpatient volume-based measures of Medicare dependence. [30] This indicates that a higher volume of inpatient services was not associated with lower profitability.

Agency Comments

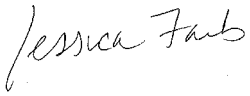
We provided a draft of this report to the Department of Health and Human Services for comment. The Department of Health and Human Services provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the Secretary of the Department of Health and Human Services. In addition, this report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staffs have any questions about this report, please contact me at (202) 512-7114 or farbj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page

[30]For MDHs in these regression models, total facility margin was calculated without including the additional MDH payment as a way of isolating and removing program impact.

of this report. GAO staff who made key contributions to this report are listed in appendix IV.



Jessica Farb
Director, Health Care

Appendix I: Scope and Methodology

This appendix explains the quantitative scope and methodology used to examine how the Medicare-dependent hospital (MDH) designation differs from the other Medicare rural hospital designations. This appendix also explains the scope and methodology used to describe changes in the number and selected metrics of MDHs and other hospital types, including those used for a regression analysis to provide information on the relationship between MDH program criteria and Medicare dependence.

Differences between MDH and Other Designations

To describe how the MDH designation differs from other rural hospital designations, we used CMS data—specifically, the Provider Specific File (PSF)—to identify the number of MDHs, critical access hospitals (CAH), sole community hospitals (SCH), rural low-volume adjustment hospitals (LVA), and rural referral centers (RRC) in fiscal year 2017.[1] We then identified all rural hospitals without a designation in 2017 using the 2018 CMS Inpatient Prospective Payment System (IPPS) Impact File because those data are prepared in the middle of the year preceding the fiscal year.[2] We define rural hospitals using the CMS MDH programmatic definition; that is, those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes. We next identified the number of hospitals with each designation and the value of additional payments received under the rural designations that each hospital had in that year using data provided by each hospital through their Medicare Cost Report (MCR). [3] The MCR is submitted to CMS by hospitals each fiscal year and contains information such as facility characteristics, utilization data, and costs to provide services to Medicare beneficiaries and all patients. Because CAHs are paid based on cost under a different payment system than the other hospitals, we did not have complete data to estimate what those

[1]The PSF contains information about Medicare providers, including hospitals, that affects Medicare payments. To obtain the most recent data in a given fiscal year, we defined MDHs and the various other designation using records with the latest effective date in a given fiscal year. We examined data in 2017 because that was the most recent fiscal year for which we have reliable data on costs submitted by hospitals through Medicare Cost Reports. For the first objective, we reported statistics for 2017, and for the second objective, we expanded our timeframe scope to fiscal years 2011 through 2017.

[2]CMS IPPS Impact Files are prepared in advance of the fiscal year in order to estimate the effects of payment policy change proposals. In using these files to determine rural status, we included some Lugar hospitals (hospitals that are geographically rural but deemed to be a part of an urban area).

[3]For analyses involving additional payments for designations, we excluded hospitals that had partial-year MDH and SCH status due to difficulty in attributing the value of the additional payment.

hospitals would have been paid under the inpatient prospective payment system and thus could not identify the additional payments received by CAHs. In addition, RRCs only receive indirect payment benefits, and thus we could not calculate a comparable additional payment for that group of hospitals. For all analyses, we excluded hospitals within the Indian Health Service, as well as hospitals in Maryland and those outside of the remaining 49 states and the District of Columbia.[4] We also excluded hospitals with reporting periods greater than 14 months or less than 10 months and those that reported zero or negative Medicare revenue.[5]

Number of MDHs and Selected Metrics

To describe changes in the number and select metrics of MDHs and other hospital types, we examined MCR data for fiscal years 2011 through 2017. To first identify the universe of MDHs, rural hospitals, and all acute care inpatient prospective payment system (IPPS) hospitals, we used the PSF and MCR for fiscal years 2011 through 2017, as well as CMS Impact Files for fiscal years 2012 through 2018. Then, we used the MCR to calculate the number of MDHs that received the MDH payment adjustment and the distribution of additional payments among MDHs in each year. Using those same data sources, we then calculated several metrics and examined trends for MDHs as compared to all rural hospitals and all hospitals overall. The first metric is the median proportion of total Medicare payments—referred to as revenue—each hospital group received from providing inpatient and outpatient care to Medicare beneficiaries. The second metric is hospitals' median profit margins—a profitability measure calculated as the amount of revenue the hospital received minus reported costs, divided by the amount of revenue received. We calculated profit margins specific to Medicare revenue and costs (Medicare profit margins) but also for revenue and costs beyond Medicare (total facility profit margins), including payments for treating non-Medicare (including privately insured) patients. We calculated Medicare and total facility profit margins at the hospital level using hospital-reported costs and revenues from the MCRs, and reported the

[4]We excluded some other hospitals from our analysis, such as those that are not acute care hospitals and those not paid under the prospective payment system. We excluded Indian Health Service hospitals because they are federal hospitals that generally serve American Indians and Alaska Natives, and we excluded hospitals in Maryland as well as hospitals under the Rural Community Hospital Demonstration program because they are not paid under the IPPS.

[5]Where any hospitals submitted multiple MCRs in a given fiscal year, we used the most recent MCR. We included MCRs with "settled" and "as submitted" statuses, and thus it is possible that our result could change slightly as MCRs reach final, reconciled status. The payment data reflect each hospital's fiscal year and cover different ranges of months between October 2010 and September 2017.

median margins for each hospital group. The Medicare margin reflects only payments and costs received for inpatient and outpatient services (about 90 percent of total Medicare revenue, according to CMS officials) and excludes payments and costs for other hospital-based services, such as those for skilled nursing and home health care. Third, we calculated hospitals' degree of Medicare dependence using three separate definitions, or measures, of dependence: (1) the amount of revenue the hospital received from Medicare as a share of all the revenue the hospital received for inpatient and outpatient services (total care revenue), (2) the share of inpatient days of care the hospital provides that are attributed to Medicare beneficiaries, and (3) the share of inpatient discharges that are attributed to Medicare beneficiaries. We also calculated these metrics separately for those MDHs that were eligible for the program based on data from the 1980s—legacy MDHs. To do so, we used data provided by Medicare Administrative Contractors—third-party entities that administer Medicare program payments and determine MDH eligibility.

Regression Analysis

To provide additional context on the relationship between MDH eligibility criteria and the various definitions of Medicare dependence, we developed an econometric model to analyze the association between bed size, rural status, and the three measures of Medicare dependence. We conducted the regression analysis using data from the CMS IPPS Impact Files and MCRs from fiscal years 2011 through 2017.[6] We used the following measures as dependent variables: (1) the amount of revenue the hospital received from Medicare as a share of all the revenue the hospital received for inpatient and outpatient services (total care revenue), (2) the share of inpatient days of care the hospital provides that are attributed to Medicare beneficiaries, and (3) the share of inpatient discharges that are attributed to Medicare beneficiaries.

Dependent Variables

Our dependent variable was the natural logarithm of the measure of Medicare dependence:

$$Y_{it} = \log(R_{it}) \ .$$

[6]We also used census data for some geography-based control factors, as well as state Medicaid expansion data from the Kaiser Family Foundation. We calculated bed size using the MDH programmatic definition of beds; that is, we divided the number of bed days available—excluding certain bed days such as skilled nursing facility, observation, and hospice days—by the number of days in the cost reporting period. We define rural hospitals as those hospitals that are not located in metropolitan statistical areas, as well as those hospitals that reclassified as rural for CMS payment purposes.

Where R_{it} represents the Medicare share of revenue, inpatient days or discharges, and the i and t subscripts represent the hospital and year, respectively. This formulation has the advantage of restricting the models' predicted values to be positive and also allows for a relatively straightforward interpretation of the parameter estimates.

Explanatory Variables

- We included hospital capacity or size as measured by the number of hospital beds. The number of beds is itself one of the criteria for MDH eligibility, and we were interested in whether hospitals of smaller sizes have more or less Medicare dependency.
- We included an indicator variable flagging whether the hospital is in a rural location. Rural location is one of the criteria for MDH program eligibility, and so this was a key variable in our model.
- We included the ownership category of the hospital, such as whether a hospital is for-profit or not for-profit, or whether it is a public or private institution. This organizational category may determine institutional characteristics, which affects the likelihood that the hospital serves either more or fewer Medicare beneficiaries.
- We included the degree of proximity to other hospitals of substantive size; specifically, the distance from the closest hospital with at least 100 beds. In addition to our rural indicator variable, this controlled for whether more remote hospitals are more likely to be more dependent on Medicare.
- We included whether the state in which the hospital is located has expanded Medicaid to provide coverage to low-income, non-elderly adults, because it is possible that an increased number of Medicaid-eligible patients may affect the number of Medicare patients using hospital services. This variable may be associated with less Medicare dependence if Medicaid becomes a relatively larger payer source, or it may be associated with more Medicare dependence if Medicaid eligibility brings Medicare-eligible people into the health care system.
- We included the percent of population in the hospital's county over age 65, because areas with larger numbers of people over age 65 may be more likely to have a higher proportion of Medicare beneficiaries using health care services.
- We included the percent growth in county population, which allowed us to control for areas with declining populations that may be more likely to contain Medicare-dependent hospitals.
- Our model included time fixed effects (a dummy variable for each year in the analysis). The time fixed effects controlled for factors affecting

hospitals nationally in as given year—in particular, those factors for which data were unavailable.

- We included a set of state fixed effects (a dummy variable for each of the states in the analysis) to control for effects that are common to a specific area, but for which data may have been unavailable.
- We estimated specifications that included interactions between our bed size categories and rural location. This allowed us to determine whether bed size had the same impact on Medicare dependence for hospitals in rural locations compared with those in urban locations.

Model Specification

We use a panel model comprising observations on hospitals that receive Medicare revenue over time (fiscal years 2011 to 2017). The regression model can be written as follows:

$$\ln(R_{it}) = \sum_{t=2}^{T} f_t F_t + \sum_{s=2}^{S} g_s G_s + X_{it}\beta + C_{st}\gamma + \varepsilon_{it}, t = 1, \dots, T;\ i = 1, \dots, H.$$

In this specification:

- The dependent variable is the logarithm of our measure of Medicare dependence, R_{it}.
- X_{it} is a 1 x k vector of hospital characteristics and possible interactions of these characteristics, where i denotes the ith hospital and t denotes the year. X_{it} contains key explanatory variables such as ownership type, the number of beds, rural or urban location, whether a hospital receives MDH program monies and other characteristics.
- β is a k x 1 vector of parameters associated with the hospital characteristics, X_{it}.
- $\sum_{t=2}^{T} f_t F_t$ represents the set of time (year) dummy variables (upper case) and their associated (lower case) parameters.
- $\sum_{s=2}^{S} g_s G_s$ represents the set of state dummy variables (upper case) and their associated (lower case) parameters.
- C_{st} is a 1 x m vector of time-varying county-level variables hospital characteristics such as the percent of the population over 65 and the county population growth rate.
- γ is an m x 1 vector of parameters associated with the state-level characteristics, C_{ct}.

- Our model includes an interaction effect between the rural dummy variable and each of the characteristics except the geographic fixed effects.
- ε_{it} is a well-behaved Gaussian random error term that may have a heteroskedastic and/or clustered structure.
- We used Stata® to estimate the regression model, using fixed effects at the state-level to account for unobserved heterogeneity and clustering at the county-level.

Specification of the Bed Size Categories and Geographic Fixed Effects

Our focus was on the main criteria for MDH eligibility—namely hospital size as measured by number of beds and rural versus no-rural hospital location. We divided the hospitals into five bed number categories:

- 50 beds or fewer
- Over 50 beds to 100 beds
- Over 100 beds to 300 beds
- Over 300 beds to 400 beds
- Over 400 beds

This categorization strikes a balance between having too many categories, which would reduce the statistical power of our analysis, and having too few categories, which would fail to identify any non-linear pattern in the statistical relationship. These categories also contain the 100 bed criterion as one of the cut-off points.

Our analysis controls for location and possible heterogeneity by using geographic fixed effects but we also want to identify the impact of rural location. Selecting too detailed a level of geographic fixed effect such as county or zip code would limit our ability to identify the rural effect so we used states. We recognized that state fixed effects may not identify more localized effects; this is a limitation of our model.

Total Facility Profit Margins and Measures of Medicare Dependence

We also modeled the effects of hospital characteristics on total facility profit margins; that is, the difference between revenue and costs as a percent of revenue. For MDHs in our analysis, we excluded any MDH additional payment from the margin calculation in order to isolate and remove the program impact on financial status.

We used the same explanatory factors in our econometric model of hospital margins as in our models of Medicare dependence but we supplement these factors with our three measures of Medicare

dependence—a separate model for each measure. This allowed us to assess how our different measures of Medicare dependence are associated with financial well-being.

We assessed the reliability of the relevant fields in each of the data sets we used for these analyses by interviewing CMS officials, reviewing related documentation, and performing data checks. On the basis of these steps, we concluded that the data were sufficiently reliable for the purposes of our reporting objective.

Appendix II: Medicare Rural Hospital Payment Designation Eligibility and Payment

We identified five Medicare rural hospital payment designations and categorized them into two categories: (1) primary payment designations and (2) secondary payment designations. Primary designations include critical access hospitals (CAH), sole community hospitals (SCH), and Medicare-dependent Hospitals (MDH). Each designation has distinct eligibility requirements and payment methodologies.

Table 4: Medicare Rural Hospital Designation Eligibility Requirements and Payment Methodologies

Medicare rural hospital designation	Key eligibility requirements	Payment methodology for additional inpatient and outpatient payments
Primary designations[a]		
Medicare-dependent hospital (MDH)[b]	• At least 60 percent of inpatient days or discharges attributed to Medicare, • 100 beds or fewer, and • either 1) rural or 2) urban in a non-rural state and meeting other specified criteria.	• Inpatient: 75 percent of the difference between the inpatient prospective payment system (IPPS) amount and the hospital-specific rate (HSR) based on historic costs, adjusted for case mix and inflation, for the highest of three cost years: 1982, 1987, or 2002. If the IPPS amount is higher than the HSR, no additional payment is made.[c,d] • Outpatient: none.
Critical access hospital (CAH)[e]	• Either more than a 35 mile drive from nearest hospital, more than a 15 mile drive via mountainous or secondary roads, or deemed by the state to be a necessary provider prior to 2006; • average annual acute care length of stay of 96 hours or less; • 25 or fewer inpatient beds; and • rural or reclassified as rural.	• Inpatient: generally, 101 percent of reasonable cost.[f] • Outpatient: generally, 101 percent of reasonable cost.
Sole community hospital (SCH)[g]	• More than 35 miles from a like hospital;[h] or • rural (or reclassified as rural) and meets other criteria for geographic remoteness.	• Inpatient: 100 percent of the difference between the IPPS amount and the HSR based on historic costs, adjusted for case mix and inflation, for the highest of three cost years: 1982, 1987, 1996, or 2006. If the IPPS amount is higher than the HSR, no additional payment is made; also, exempt from certain requirements related to geographic reclassification.[c] • Outpatient: 7.1 percent additional payment.
Secondary designations[a]		
Low-volume adjustment hospital (LVA)[i]	• No more than 3,800 total discharges in 1 year, and • more than 15 road miles from another acute-care hospital.	• Inpatient: Additional percentage based on number of total discharges, generally up to a maximum of 25 percent. • Outpatient: none.

Medicare rural hospital designation	Key eligibility requirements	Payment methodology for additional inpatient and outpatient payments
Rural referral center (RRC)[j]	• Located in a rural area and generally has at least 275 beds or • located in a rural area and meets certain criteria regarding case-mix volume, number of discharges, and either 1) medical staff, 2) source of inpatients, or 3) volume of referrals.	• Inpatient: No direct additional payment, but exempt from certain requirements related to geographic reclassification.[d] • Outpatient: none.

Source: GAO analysis of Centers for Medicare & Medicaid Services guidance and regulations. | GAO-20-300

[a]We define primary designations as those for which hospitals cannot overlap; in other words, hospitals are only eligible for one primary designation for any given period of time. We define secondary designations as those that can overlap with the MDH or SCH designation, respectively. Because CAHs are considered to be a different provider type and are not paid under the IPPS, they are ineligible for other payment designations.

[b]See generally 42 U.S.C. § 1395ww(d)(5)(G), 42 C.F.R. § 412.108 (2019) (MDH eligibility requirements and payment methodology).

[c]An additional adjustment is available to some MDHs and SCHs that experience a greater than 5 percent decline in inpatient volume due to circumstances beyond their control.

[d]MDHs and RRCs are also exempt from the 12 percent cap on Medicare disproportionate share hospital payments applicable to other rural hospitals.

[e]See generally 42 U.S.C. § 1395i-4, 42 C.F.R. §§ 485.601 et seq. (2019) (CAH eligibility requirements); 42 U.S.C. §§ 1395f(l), 1395m(g); 42 C.F.R. § 413.70 (2019) (CAH payment methodology).

[f]CAHs are reimbursed at 1 percent above reasonable costs. In addition, CAHs are paid based on the relevant standard prospective payment system methodologies for inpatient services provided in distinct part psychiatric and rehabilitation units.

[g]See generally 42 U.S.C. § 1395ww(d)(5)(D), 42 C.F.R. § 412.92 (2019) (SCH eligibility requirements and inpatient payment methodology); 42 U.S.C. § 1395l(t)(13)(B), 42 C.F.R. § 419.43(g) (2019) (SCH outpatient payment methodology).

[h]"Like" hospitals are generally those that furnish short-term, acute care paid under the IPPS.

[i]See generally 42 U.S.C. § 1395ww(d)(12), 42 C.F.R. § 412.101 (2019) (LVA eligibility requirements and additional payment methodology).

[j]See generally 42 U.S.C. § 1395ww(d)(5)(C), 42 C.F.R. § 412.96 (2019) (RRC eligibility requirements and payment methodology).

Appendix III: Full Regression Results

This appendix describes the full results for our modeling of Medicare dollars as a percentage of total revenue, the percent of inpatient days, the percent of inpatient discharges, and total hospital profit margins.

Results for Modeling Medicare Revenue as a Share of Total Revenue

We tested for the hypothesis that key groups of parameters were significantly different between urban and rural locations.

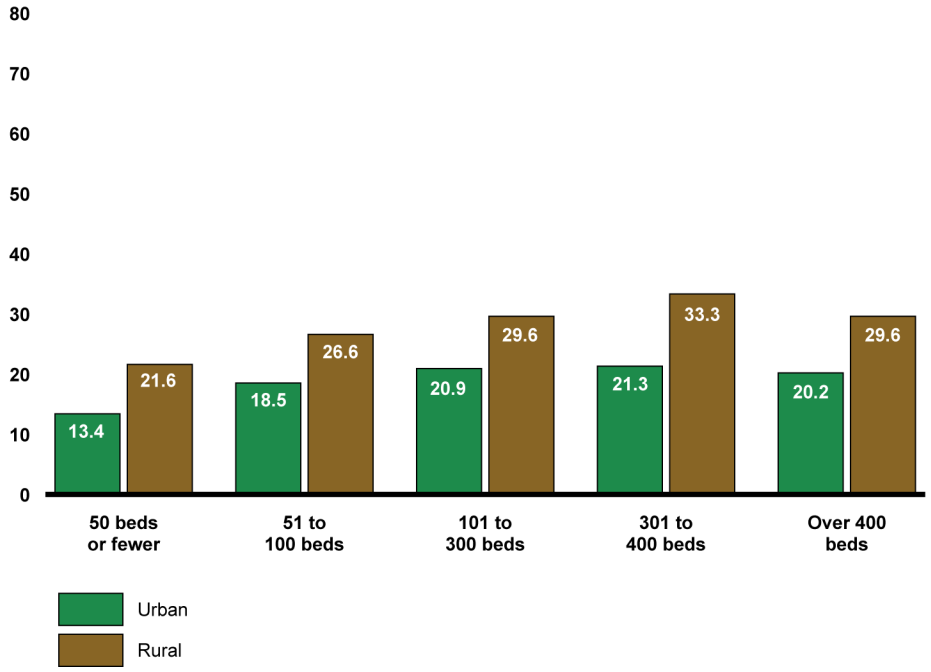
- We performed a k-parameter post-estimation Wald linear restriction test of the form

$$\beta_k^u - \beta_k^r = 0$$

where β_k^u and β_k^r are matrices of the estimated urban and rural parameters, respectively, for each of the k categories (bed-size, ownership type, etc.). We rejected the null hypothesis of parameter equality for bed-size, ownership types, Medicaid expansion, and year dummies at the 5 percent level. The miles distance parameters rejected the hypothesis at marginally above the 5 percent level.

- Rural hospitals generally were associated with larger Medicare shares of revenue than urban hospitals. In every bed-size category, the parameters for rural hospitals were significantly greater than for urban hospitals. In addition, controlling for urban-rural location, with the exception of the largest hospital category (over 400 beds) hospitals with fewer beds had a smaller Medicare share of revenue, as shown in figure 8.

Figure 8: Hospitals' Estimated Medicare Share of Total Revenue by Geography and Bed Size



Source: GAO analysis of Centers for Medicare & Medicaid Services. | GAO-20-300

- Hospitals in counties with higher percentages of people over age 65 were significantly associated with greater Medicare dependence.

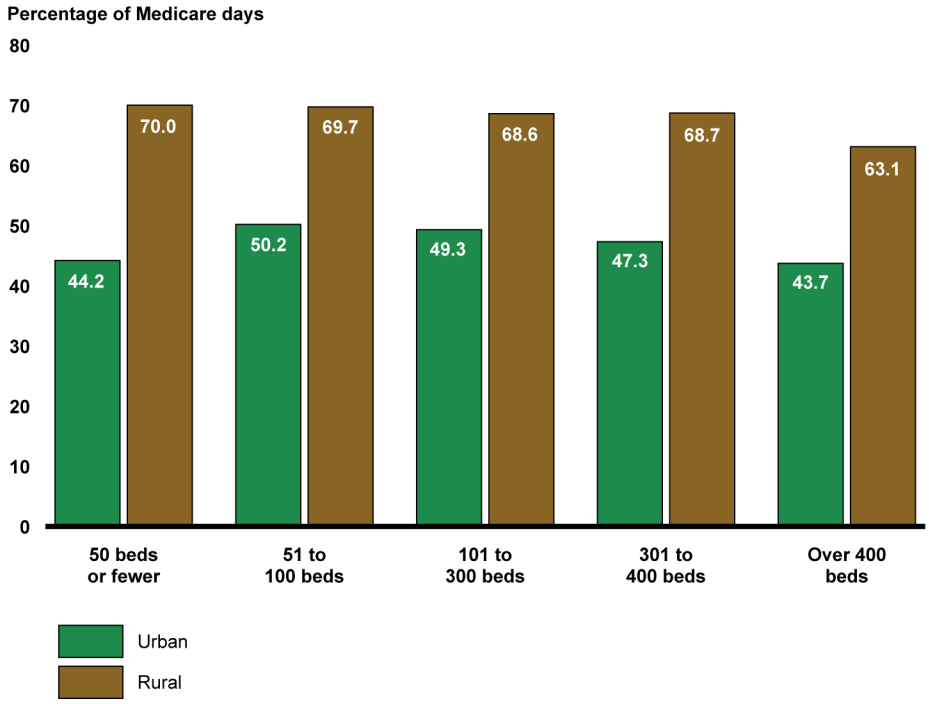
Results for Modeling Medicare as a Share of Total Inpatient Days

Our Wald tests rejected the null that parameters rural and urban were equal in the bed-number categories and in the ownership categories.

- As with the Medicare share of total revenue, our model for Medicare share of inpatient days showed, controlling for bed numbers, that rural hospitals generally had significantly greater Medicare dependence than urban hospitals. In most bed-size categories, the parameters for rural hospitals were greater than for urban hospitals.
- The pattern for bed size was different for Medicare dependence measured in revenue in that for rural hospitals, dependence fell as bed numbers rose, but, for urban hospitals, we observed a hump-shape distribution with the middle bed-number categories having

higher dependence than the smallest and largest categories, as shown in figure 9.

Figure 9: Hospitals' Estimated Medicare Share of Inpatient Days by Geography and Bed Size



Source: GAO analysis of Centers for Medicare & Medicaid Services. | GAO-20-300

- Hospitals located in counties with higher percentages of people over age 65 had higher dependence.

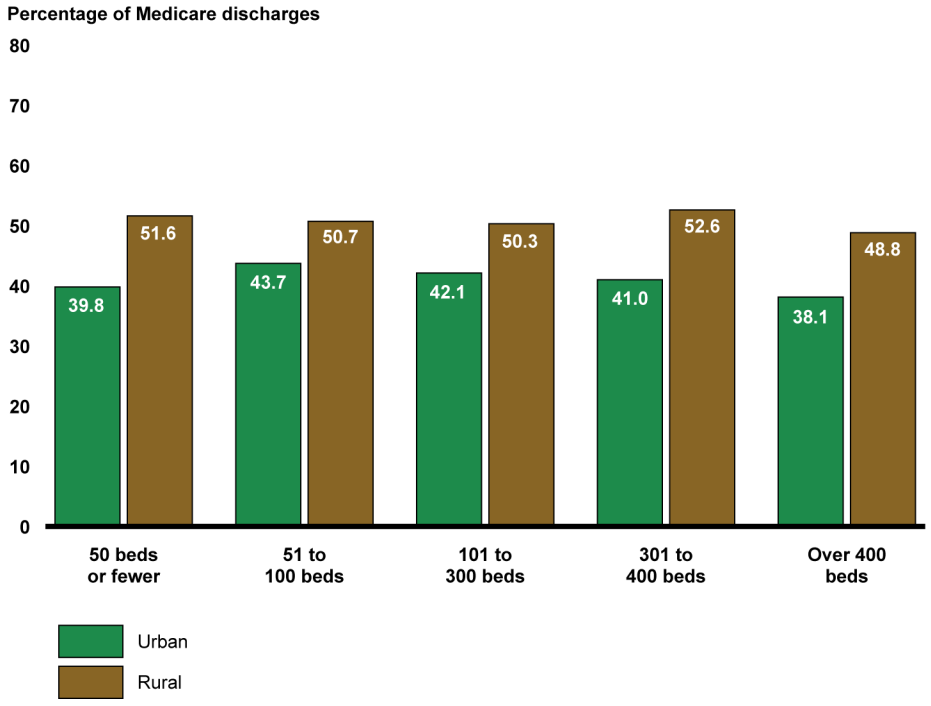
Results for Modeling Medicare as a Share of Total Inpatient Discharges

Our model for the Medicare share of inpatient discharges showed that, controlling for bed numbers, rural hospitals generally had greater Medicare dependence than urban hospitals.

- In most bed-size categories, the parameters for rural hospitals were significantly greater than for urban hospitals. Our Wald tests rejected the null hypothesis that parameters for rural and urban were equal in the bed-size categories, Medicaid expansion variables, and in the ownership categories.

- The pattern for bed numbers was also different to Medicare dependence measured in revenue. The urban hospitals had a hump-shape distribution with the middle bed-number categories having higher dependence than the smallest and largest categories, whereas the rural showed largest effects at the smallest and the larger intermediate categories, as shown in figure 10.

Figure 10: Hospitals' Estimated Medicare Share of Inpatient Discharges by Geography and Bed Size



Source: GAO analysis of Centers for Medicare & Medicaid Services. | GAO-20-300

- Hospitals located in counties with higher percentages of people over age 65 had higher dependence.

Results for Modeling Hospital Profit Margins

The Medicare share of total revenue was significantly associated with smaller total facility profit margins and was the only statistically significant measure of Medicare dependence in the margin models. In general, hospitals with small numbers of beds—fewer than 100—were associated with smaller hospital margins relative to our reference category of large

urban hospitals. However, there was no significant difference in any of the bed-number categories between urban and rural hospitals.

Table 5: Regression Results for Models of Medicare Dependence

	Dependent variables used logs of the measures of Medicare dependence		
	Medicare share of total revenue	**Medicare share of inpatient days**	**Medicare share of inpatient discharges**
Urban - 50 beds or fewer	-0.414***	0.0104	0.0454
	(0.00000)	(0.82505)	(0.33550)
Urban - over 50 beds to 100 beds	-0.0903**	0.139***	0.138***
	(0.00376)	(0.00000)	(0.00000)
Urban - over 100 beds to 300 beds	0.0312	0.120***	0.0993***
	(0.11029)	(0.00000)	(0.00000)
Urban - over 300 beds to 400 beds	0.0525*	0.0793***	0.0731***
	(0.02560)	(0.00010)	(0.00084)
Urban - over 400 beds (omitted reference category)	0	0	0
	(.)	(.)	(.)
Rural - 50 beds or fewer	0.0688	0.471***	0.305***
	(0.63878)	(0.00000)	(0.00051)
Rural - over 50 beds to 100 beds	0.274	0.467***	0.286***
	(0.05995)	(0.00000)	(0.00099)
Rural - over 100 beds to 300 beds	0.380**	0.451***	0.278**
	(0.00916)	(0.00000)	(0.00143)
Rural - over 300 beds to 400 beds	0.500***	0.452***	0.323***
	(0.00083)	(0.00000)	(0.00026)
Rural - over 400 beds	0.382*	0.367***	0.249**
	(0.01125)	(0.00001)	(0.00581)

	Dependent variables used logs of the measures of Medicare dependence		
	Medicare share of total revenue	Medicare share of inpatient days	Medicare share of inpatient discharges
R-squared	0.258	0.214	0.214
Observations	20787	20787	20787

Legend: * = significant at the 0.1 percent level; ** = significant at the 1 percent level; *** = significant at the 5 percent level

Source: GAO analysis of Centers for Medicare & Medicaid (CMS) data. | GAO-20-300

Notes: Significance levels are in parentheses below the parameter estimates. The models were estimated with heteroskedastic-robust standard errors, clustered at the county level. Other variables included in the model but not reported were controls for ownership category, location in a state with Medicaid expansion, proximity to another hospital with at least 100 beds, a set of year-time dummies, a set of state fixed effects, the percent of population in the county over 65, and the annual growth of the county population. Except for the state fixed effects, each variable was interacted with a rural-urban dummy.

Table 6: Regression Results for Models of Total Facility Profit Margins

	Total margin without Medicare-Dependent Hospital (MDH) additional payment		
	Includes Medicare share of total revenue as regressor	Includes Medicare share of inpatient days as regressor	Includes Medicare share of inpatient discharges as regressor
Urban - 50 beds or fewer	-0.0390***	-0.0253*	-0.0249*
	(0.00020)	(0.01397)	(0.01566)
Urban - over 50 beds to 100 beds	-0.0391***	-0.0359***	-0.0359***
	(0.00000)	(0.00001)	(0.00001)
Urban - over 100 beds to 300 beds	-0.0165**	-0.0196***	-0.0197***
	(0.00121)	(0.00019)	(0.00015)
Urban - over 300 beds to 400 beds	0.000105	-0.00383	-0.00388
	(0.98363)	(0.44932)	(0.44378)
Urban - over 400 beds (omitted reference category)	0	0	0
	(.)	(.)	(.)
Rural - 50 beds or fewer	-0.0434	-0.0319	-0.0330
	(0.10362)	(0.21398)	(0.19983)

	Total margin without Medicare-Dependent Hospital (MDH) additional payment		
	Includes Medicare share of total revenue as regressor	Includes Medicare share of inpatient days as regressor	Includes Medicare share of inpatient discharges as regressor
Rural - over 50 beds to 100 beds	-0.0111	-0.00998	-0.0114
	(0.66787)	(0.69385)	(0.65538)
Rural - over 100 beds to 300 beds	0.0245	0.0179	0.0165
	(0.34623)	(0.48034)	(0.51677)
Rural - over 300 beds to 400 beds	0.0532	0.0395	0.0385
	(0.05324)	(0.14296)	(0.15540)
Rural - over 400 beds	0.0476	0.0414	0.0405
	(0.07650)	(0.11225)	(0.12116)
Medicare share of total revenue	-0.305***		
	(0.00000)		
Medicare share of inpatient days		-0.0167	
		(0.37637)	
Medicare share of inpatient discharges			-0.0195
			(0.30618)
R-squared	0.129	0.107	0.107
Observations	20787	20787	20787

Legend: * = significant at the 0.1 percent level; ** = significant at the 1 percent level; *** = significant at the 5 percent level

Source: GAO analysis of Centers for Medicare & Medicaid Services (CMS) data. | GAO-20-300

Notes: Significance levels are in parentheses below the parameter estimates. The models were estimated with heteroskedastic-robust standard errors, clustered at the county level. Other variables included in the model but not reported were controls for ownership category, location in a state with Medicaid expansion, proximity to another hospital with at least 100 beds, a set of year-time dummies, a set of state fixed effects, the percent of population in the county over 65, and the annual growth of the county population. Except for the state fixed effects, each variable was interacted with a rural-urban dummy.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, Gregory Giusto (Assistant Director), Kate Nast Jones (Analyst-in-Charge), Britt Carlson, Rachel Gringlas, Michael Kendix, Vikki Porter, Caitlin Scoville, Jennifer Rudisill, and Jeffrey Tamburello made key contributions to this report.