CHAPTER 2

Medicare Advantage payment areas and risk adjustment

RECOMMENDATIONS

2A The Congress should establish payment areas for Medicare Advantage local plans that have the following characteristics:

- Among counties in metropolitan statistical areas, payment areas should be collections of counties that are located in the same state and the same metropolitan statistical area.
- Among counties outside metropolitan statistical areas, payment areas should be collections of counties in the same state that are accurate reflections of health care market areas, such as health service areas.

COMMISSIONER VOTES: YES 16 • NO 0 • NOT VOTING 0 • ABSENT 1

2B The Secretary should update health service areas before using them as payment areas in the Medicare Advantage program. In addition, the Secretary should make periodic updates to health service areas to reflect changes in health care market areas that occur over time.

COMMISSIONER VOTES: YES 16 • NO 0 • NOT VOTING 0 • ABSENT 1

CHAPTER 2

Medicare Advantage payment areas and risk adjustment

In this chapter

- AAPCCs vary widely
- How can Medicare improve payment areas for MA local plans?
- Payment area recommendations
- How accurately does the CMS–HCC model reflect cost differences?

MedPAC is mandated to identify the appropriate payment area for Medicare Advantage (MA) local plans and assess the new risk-adjustment system in the MA program. The current county definition of payment areas presents two problems. First, some counties have too few beneficiaries to obtain stable adjusted average per capita costs. Second, adjacent counties often have very different payment rates. Plans may offer more limited benefits in the counties with the lower rates or avoid them altogether. Our recommendation addresses these problems by collecting counties into larger groups. Among urban counties, payment areas should be counties that are located in the same metropolitan statistical area. Among rural counties, payment areas should be collections of counties that are accurate reflections of health care market areas. Our assessment of the new risk-adjustment system indicates that it predicts beneficiaries' costs much better than a "demographic" system that CMS has used for a number of years.

The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) directs MedPAC to study three issues related to the payment system in the Medicare Advantage (MA) program (see text box for bill language):

- The factors underlying geographic variation in adjusted average per capita costs (AAPCCs), including differences in input prices, service use, and practice patterns;
- The appropriate geographic area for payment of MA local plans; and
- The accuracy of the CMS–hierarchical condition category (CMS–HCC) risk-adjustment model in terms of how well it reflects differences in costs of providing care to different groups of beneficiaries.

AAPCCs are five-year moving averages of per beneficiary spending at the county level by fee-for-service (FFS) Medicare. CMS adjusts AAPCCs for county differences in FFS beneficiaries' health status. In the Medicare risk program that preceded Medicare Advantage and Medicare+Choice (M+C), the county payment rates that served as the base rates for plan payments equaled 95 percent of the AAPCCs.

The direct link between AAPCCs and payments created perceptions of geographic inequity. Plans were more likely to serve counties with high AAPCCs and typically offered more comprehensive benefits. Many policymakers viewed the geographic differences in benefits and availability of plans as inequitable (MedPAC 2001).

In response to the variation in plan benefits and availability, the Balanced Budget Act of 1997 (BBA) created the M+C program and reduced the link between AAPCCs and payments. Under the BBA, county rates were the highest of three possibilities or prongs:

- a floor rate,
- a blend of local and national rates, or
- a minimum update from the previous year.

Under this new payment system, plan payments often increased more slowly than plan costs, causing many plans to leave the M+C program or reduce benefits. In response, the MMA created the MA program and reestablished a stronger link between payments and AAPCCs by making county rates in 2004 the maximum of four prongs: the three from the BBA plus the AAPCCs. In subsequent years, CMS will update county rates by 2 percent or the national average growth in FFS spending, whichever is

Medicare Prescription Drug, Improvement, and Modernization Act, Title II, Sec. 211(f)

(f) MedPAC study of AAPCC.

(1) Study. The Medicare Payment Advisory Commission shall conduct a study that assesses the method used for determining the adjusted average per capita cost (AAPCC) under section 1876(a)(4) of the Social Security Act (42 U.S.C. 1395mm(a)(4)) as applied under section 1853(c)(1)(A) of such act (as amended by subsection (a)). Such study shall include an examination of:

(A) the bases for variation in such costs between different areas, including differences in input prices, utilization, and practice patterns.

(B) the appropriate geographic area for payment of MA local plans under the Medicare Advantage program under part C of title XVIII of such Act; and

(C) the accuracy of risk adjustment methods in reflecting differences in costs of providing care to different groups of beneficiaries served under such program.

(2) Report. Not later than 18 months after the date of the enactment of this Act, the Commission shall submit to Congress a report on the study conducted under paragraph (1). ■

larger. However, the MMA also requires CMS to recalculate AAPCCs at least every three years. For counties in which the recalculated AAPCCs exceed the updated amounts, CMS will use the recalculated AAPCCs as the county rates.

In 2004 and 2005, CMS used the county rates as the base rates for paying MA plans. In 2006 and subsequent years, CMS will use county rates to create benchmarks against which plans will bid. The benchmark for each plan will be a weighted average of the county rates for the counties in the plan's service area; the weights will be the projected enrollment from the counties in the plan's service area.

A plan that bids below its benchmark will have a base rate equal to its bid, adjusted in each county in its service area to reflect differences in the county rates. In addition, the plan will receive 75 percent of the difference between its bid and its benchmark, which the plan must return to its enrollees in the form of additional benefits, reduced cost sharing, or lower premiums. The federal government will retain the remaining 25 percent. Chapter 3 of this report provides more detail on the bidding process. A plan that bids above its benchmark will have a base rate equal to its benchmark, adjusted in each county in its service area to reflect differences in the county rates. The plan's enrollees will pay a premium equal to the difference between its bid and its benchmark.

Medicare's use of county payment rates to create benchmarks reflects the fact that counties serve as the payment area for MA local plans. These plans are "local" in that their service areas can be as small as a single county. This contrasts with regional plans that will begin service in 2006. Regional plans must serve entire regions, the smallest of which are entire states.

MA local plans receive capitated payments for each enrollee. Each payment is the product of two factors: a base payment rate (described above) and a beneficiary-level risk score that reflects the expected costliness of a beneficiary relative to the national average. Risk scores, which CMS obtains from a method of risk adjustment, have the purpose of adjusting plan payments so that Medicare pays plans appropriately based on their enrollees' risk profiles. If risk adjustment does not function properly, payments will not accurately reflect the risk profiles of plans' enrollees. Some plans will be overpaid while others will be underpaid, depending on their enrollees' risk profiles. This can lead to competitive advantages for plans with favorable risks. Further, inaccurate accounting for risk can lead Medicare to pay more or less than intended to the MA program.

The Medicare risk program's risk-adjustment model used administrative data including beneficiaries' age, sex, and other demographic features as well as some program features. Research shows that this "demographic" model does not effectively account for differences in beneficiaries' expected costliness to the Medicare program. Consequently, Medicare paid more for MA enrollees who were in good health and less for those who were in poor health than for similar FFS beneficiaries.

The BBA required the Secretary to improve the risk-adjustment system. As a first step, CMS began using the principal inpatient diagnostic cost group (PIP–DCG) model in 2000. The PIP–DCG measures beneficiaries' health status using demographic information and principal diagnoses from hospital inpatient stays in a defined prior 12-month period.

The Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 mandated that in 2004, Medicare base its risk adjustment system on data from hospital inpatient and ambulatory settings. CMS has developed this model—the CMS–HCC—and began using it in 2004. By law, CMS must phase in the CMS–HCC, so the agency currently uses two systems to risk adjust payments to MA plans: The CMS–HCC adjusts 50 percent of each payment, and the demographic system adjusts the remaining 50 percent. The percentage of each payment that the CMS–HCC will adjust will increase to 75 percent in 2006 and 100 percent in 2007. CMS will introduce a new version of the CMS–HCC in 2007 that will include more diseases than the current version.

AAPCCs vary widely

In MedPAC's June 2003 report, we examined an issue similar to variation in AAPCCs: state-level variation in FFS spending per beneficiary (MedPAC 2003). We sought to identify how much of the variation in FFS spending by state we can attribute to:

- the price of inputs such as wages and office rents;
- special payments received by some hospitals, including graduate medical education (GME) payments, indirect medical education (IME)

payments, and disproportionate share (DSH) payments to hospitals that provide indigent care; and

- beneficiaries' health status.

We calculated measures of variation among states before and after we adjusted for these factors.[1] We found that adjusting FFS spending for geographic differences in these factors reduces the variation by nearly 40 percent.

In this study, we use largely the same method to analyze variation, with three differences: a different geographic unit (counties), a slightly different variable (AAPCCs), and we did not identify variation due to differences in beneficiaries' health because CMS adjusts AAPCCs for health already (see text box). Without the need to adjust for differences in health, our analysis identified variation in AAPCCs attributable to geographic differences in the price of inputs and IME, GME, and DSH payments.

Adjusting for differences in the price of inputs and in IME, GME, and DSH payments reduces the variation in AAPCCs by about 14 to 17 percent, depending on the measure (Table 2-1).[2] We attribute the variation that remains after we adjusted AAPCCs for these factors to providers' practice patterns, beneficiaries' preferences for care, and the mix of providers.

TABLE 2-1

Differences in price of inputs and special payments to hospitals account for about 15 percent of variation in AAPCCs

	Measure of variation		
AAPCC	**Standard deviation**	**Coefficient of variation**	**Average of absolute difference**
Adjusted for health	76.2	14.4	60.7
Adjusted for health; input prices; and IME, GME, and DSH payments	65.8	12.3	50.1
Percent change	13.6%	14.4%	17.4%

Note: AAPCC (adjusted average per capita cost), IME (indirect medical education), GME (graduate medical education), DSH (disproportionate share). The measures of variation are weighted by number of beneficiaries in each county.

Source: MedPAC analysis of county-level fee-for-service spending and other data from CMS.

This remaining variation largely reflects differences in service use. These differences are not related to quality. In fact, measures of quality tend to be higher in low-use areas (Fisher et al. 2003, MedPAC 2003).

Even though AAPCCs are strongly related to per beneficiary FFS spending, the proportion of the variation in county-level AAPCCs for which we have accounted is much smaller than the proportion of variation in state-level per beneficiary FFS spending for which we accounted in MedPAC's June 2003 *Report to the Congress*. This discrepancy reflects the fact that CMS already adjusts AAPCCs for differences in beneficiaries' health. We analyzed county-level per beneficiary spending and attributed about 40 percent of the variation to the combination of health, input prices, and IME, GME, and DSH payments, similar to our findings for state-level per beneficiary spending.

How can Medicare improve payment areas for MA local plans?

We have identified two problems in using counties as payment areas for MA local plans. First, many counties have small Medicare populations. Among these counties, unusually high or low health care use by just a few beneficiaries can cause substantial annual changes in AAPCCs, which are based on moving averages of per beneficiary spending in FFS Medicare. For example, we estimate that the AAPCC for White Pine County, Nevada (which has 1,300 FFS beneficiaries) increased by 12 percent from 2001 to 2002.

Large annual changes in AAPCCs become an issue when CMS makes annual updates to county payment rates. For example, if CMS recalculates AAPCCs using data from a year in which a county experienced unusually large FFS spending, the county could have a county rate much higher than its "true" AAPCC. CMS could carry forward that erroneously high rate through the update mechanism that increases county rates by the larger of 2 percent or the percentage increase in the national average FFS spending.

A second problem that counties present is that adjacent counties often have very different AAPCCs. When this occurs, plans tend to offer more limited benefits in the county with the lower AAPCC—or to avoid that county altogether (MedPAC 2001).

Method for measuring variation in adjusted average per capita costs

We estimated an adjusted average per capita cost (AAPCC) for each county using data on Part A and Part B spending from 1998 through 2002. We calculated per beneficiary Part A and Part B amounts in each county for each of those years. We then calculated five-year averages of the Part A and Part B amounts and added those results to create a per beneficiary FFS spending amount for each county.

CMS standardizes AAPCCs using beneficiaries' risk scores from the CMS–hierarchical condition category risk-adjustment model. To be consistent with CMS, we divided each county's per beneficiary FFS spending by the average risk score for FFS beneficiaries living in that county. The end result of this method is the AAPCCs that we used to analyze variation among counties.

In our measures of variation, we weight each county by its Medicare population. The result is we weight beneficiaries— not counties—equally. Without weighting, beneficiaries in less populous counties would have more influence on the variation than those in more populous counties.

Variation in the price of inputs to care has an important effect on variation in AAPCCs. The Medicare program uses hospital wage indexes (HWIs) and three geographic practice cost indexes (GPCIs) to adjust provider payments for geographic differences in input prices. CMS uses the three GPCIs to create geographic adjustment factors (GAFs) that are weighted averages of the GPCIs. We used the HWIs and GAFs to determine the effect that differences in input prices have on the variation in AAPCCs. ■

These two problems are fairly easy to solve. Any payment area definition that groups counties into larger geographic units would increase the number of Medicare beneficiaries within payment areas, making AAPCCs more stable over time.[3] In addition, grouping would reduce the frequency of large differences in AAPCCs among adjacent counties. Although plans often create service areas that consist of clusters of contiguous counties, these clusters do not address the problems presented by the county definition of payment areas. Instead, payment areas should be defined groups of counties and plans should, in general, be required to cover the entire payment area. The Secretary could make exceptions in situations in which plans have difficulty creating a provider network throughout a payment area.

Developing an appropriate payment area involves more than simply grouping counties, however. When we consider alternative payment areas, we must be attentive to two issues:

- Although we advocate larger payment areas, they must not be so large that the cost of serving beneficiaries would vary widely within payment areas. Indeed, some counties in the western United States cover very large areas already.
- Payment areas should closely match the market areas that plans serve.

If a payment area definition fails to address either of these issues, plans may find that their payments exceed their costs in some parts of a payment area and fall short of their costs in other parts. Plans would have an incentive to serve the parts of the payment area in which they are profitable and avoid the parts in which they are not. However, if Medicare requires plans to serve the entire payment area they could not act on that incentive. In that situation, the potential for financial losses in some parts of a payment area may cause plans to avoid the payment area altogether.

Alternatives to the county definition of payment areas

In response to the problems presented by counties, we have developed and evaluated three alternative definitions of payment areas, all using counties as the building block:

- ***Within each state, MSAs for urban counties and statewide rural areas for rural counties.***[4] We grouped urban counties into MSAs. If an entire MSA lies within the boundaries of a single state, the MSA

would serve as a single payment area. But if an MSA crosses state borders, the portion of the MSA in each state would serve as a distinct payment area. Within each state, we grouped all rural counties into a single statewide rural area that would serve as a distinct payment area. The first diagram in Figure 2-1 illustrates how the MSA/statewide rural area definition would look in southern Texas around the Corpus Christi, Brownsville, McAllen, and Laredo MSAs. The counties with patterns are located in MSAs, and the unshaded counties are part of the statewide rural area of Texas.

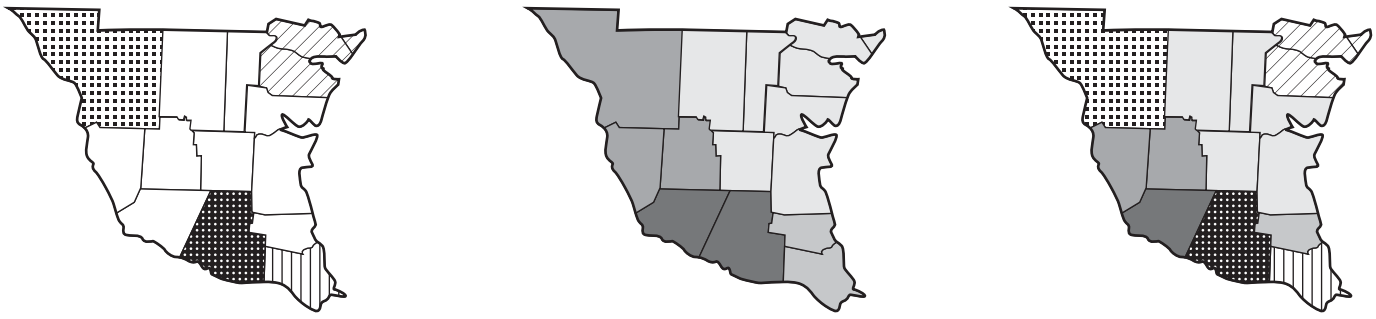
- ***Health service areas (HSAs) for urban and rural counties.*** We grouped urban and rural counties into HSAs as defined by Makuc et al. (1991) (see text box for description). If an HSA lies within the boundaries of a single state, the HSA would serve as one payment area. But if an HSA crosses state borders, the portion of the HSA in each state would serve as a distinct payment area. The second diagram in Figure 2-1 illustrates how the HSA definition would look in the same part of southern Texas shown in the first diagram.
- ***MSAs for urban counties and HSAs for rural counties.*** This definition is a hybrid of the other two alternatives. We grouped urban counties into MSAs and rural counties into HSAs. The third diagram in Figure 2-1 illustrates how the MSA/HSA definition would look around the same part of southern Texas shown in the first two diagrams. The counties with patterns are located in MSAs, and the gray-shaded counties are located in HSAs.

We chose to treat MSAs and HSAs that cross state borders as more than one payment area because plans typically face different laws, rules, and guidelines in different states. We identified 20 MSAs that cross state borders and have at least one county served by one or more coordinated care plans that participate in Medicare. In only six of these MSAs did plans consistently cross state borders and serve all the states covered by the MSA. In the other 14 MSAs, most or all plans that serve an MSA did not serve all states of that MSA.

In addition to the three alternatives discussed above, we also considered using hospital referral regions (HRRs) as a payment area definition (Wennberg and Cooper 1999). HRRs have an attractive attribute in that they represent health care market areas for tertiary medical care. Nevertheless, we chose not to use them for two reasons.

FIGURE 2-1

Three definitions of payment areas, southern Texas



MSA/Statewide rural area

HSA

MSA/HSA
Urban counties in MSAs
Rural counties in HSAs

Note: MSA (metropolitan statistical area), HSA (health service area). If an MSA or HSA is divided by state borders, the part in each state is a distinct payment area. Statewide rural areas are counties in the same state lying outside MSAs. The counties with patterns represent MSAs. The gray-shaded areas represent HSAs. The counties without patterns, in the first diagram, are part of the statewide rural area of Texas.

Source: MedPAC analysis of metropolitan statistical areas defined by the Office of Management and Budget and health service areas defined by Makuc et al. 1991.

Defining health service areas

The health service areas (HSAs) we used in our analysis consist of sets of one or more counties in which most of the short-term hospital care received by beneficiaries who live in an HSA occurs in hospitals that are in the same HSA. Very little short-term care occurs in hospitals outside the HSA.

A study by Makuc et al. (1991) defines the HSAs. Their method for grouping counties has the following features:

- They predetermined that HSAs would number about 800.[5]
- In the initial step, the number of groups equaled the number of counties (approximately 3,100).
- In the second step, they combined the two groups (counties) with the greatest "flow" of short-term hospital care among Medicare beneficiaries. They defined flow as the proportion of all hospital stays among beneficiaries in one group that occur in hospitals in another group.
- In each subsequent step, they combined the two groups with the greatest flow of short-term hospital care.
- They continued combining groups until they obtained the predetermined number of HSAs. ■

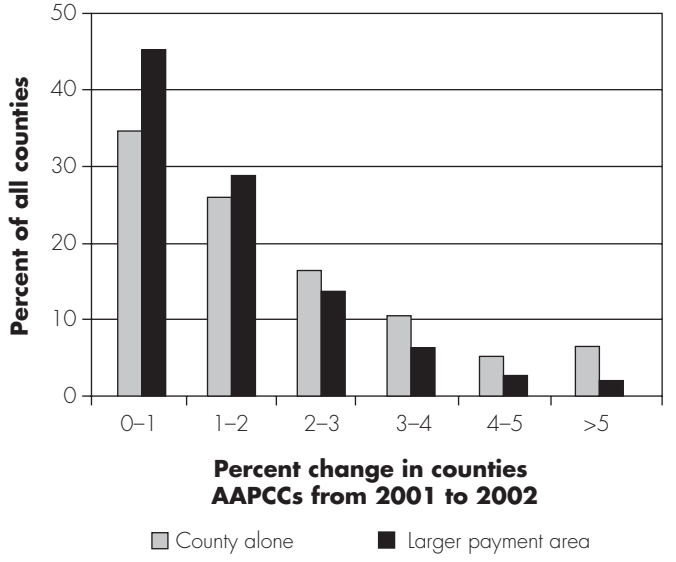
First, some are very large, covering more than half the area of large states such as New Mexico and Kansas. In these circumstances, we are concerned about large variations in cost of care within payment areas. Second, we are concerned that some HRRs—such as Albuquerque—include both urban areas and large rural areas, yet other HRRs—such as Miami—are strictly urban. Plans already behave differently in different payment areas, offering comprehensive benefits in some areas, while offering more limited benefits in other areas or avoiding them altogether. The lack of homogeneity among urban payment areas that would be caused by HRRs could exacerbate those differences.

Using larger payment areas reduces annual changes and large differences between adjacent counties

We use the MSA/HSA definition of payment areas as an illustrative example in a statistical analysis that demonstrates the advantages of payment areas that are larger than counties. We estimated AAPCCs from 2001 and 2002 that are based on four-year moving averages of per capita spending by FFS Medicare, removing the effect of increases over time in national average per capita FFS spending.[6] We then compared the 2001 and 2002 AAPCCs.

FIGURE 2-2

Larger payment areas result in more stable AAPCCs



Note: AAPCC (adjusted average per capita cost). Larger payment areas are a combination of metropolitan statistical areas (MSAs) for urban counties and health service areas (HSAs) for rural counties. If an MSA or HSA is divided by state borders, the part in each state is a distinct payment area. The results reflect absolute values of the percent change in AAPCCs from 2001 to 2002.

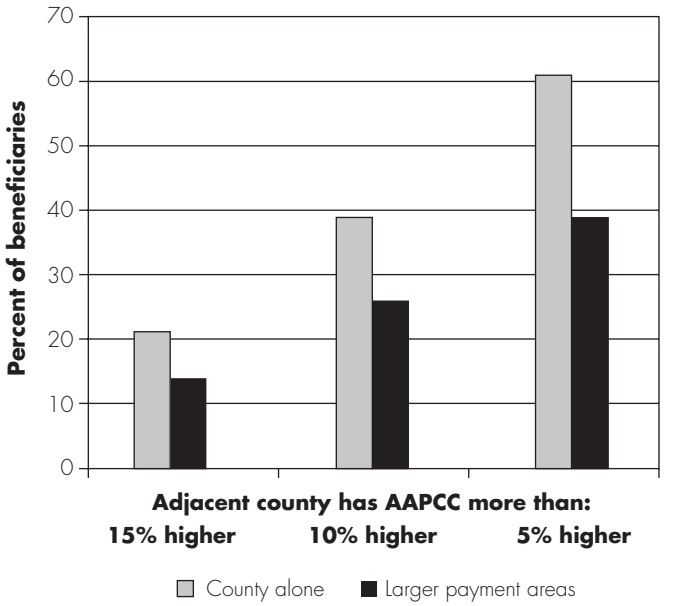
Source: MedPAC analysis of county-level fee-for-service spending and other data from CMS.

We found that using a larger payment area would produce more stable AAPCCs. The average change in AAPCCs from 2001 to 2002 under the MSA/HSA definition of payment areas is 1.4 percent, compared with 2.1 percent for the county definition. Also, larger payment areas have a less dispersed distribution of annual changes. Under the MSA/HSA definition, 45 percent of counties have an annual change of less than 1 percent, and 2 percent of counties have an annual change of more than 5 percent. Under the county definition, 35 percent of counties have an annual change of less than 1 percent, and 7 percent of counties have an annual change of more than 5 percent (Figure 2-2, p. 47).

We also found that large differences in AAPCCs between adjacent counties occur much less frequently under the larger payment areas. Under the MSA/HSA definition, 14 percent of all beneficiaries live in counties that have an adjacent county with an AAPCC that is at least 15 percent higher, compared to 21 percent of beneficiaries under the county definition (Figure 2-3).

FIGURE 2-3

Larger payment areas smooth differences in AAPCCs among counties

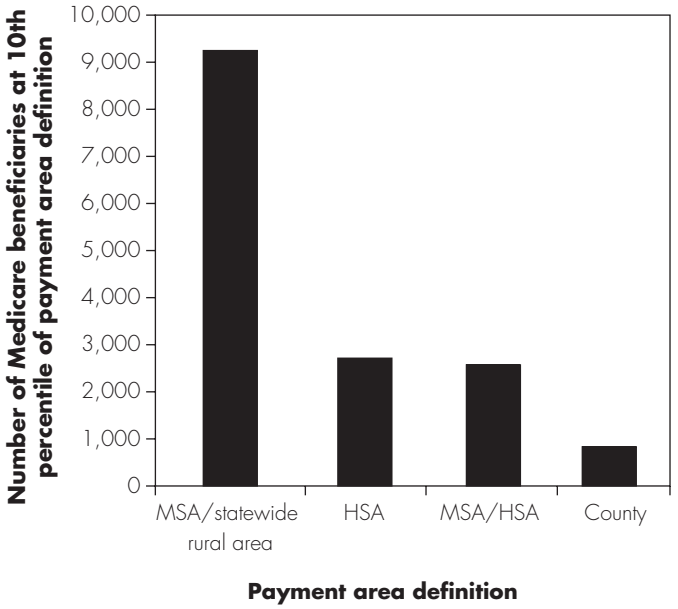


Note: AAPCC (adjusted average per capita cost). Larger payment areas are a combination of metropolitan statistical areas (MSAs) for urban counties and health service areas (HSAs) for rural counties. If an MSA or HSA is divided by state borders, the part in each state is a distinct payment area.

Source: MedPAC analysis of county-level fee-for-service spending and other data from CMS.

FIGURE 2-4

Larger payment areas have more Medicare beneficiaries and more stable AAPCCs



Note: AAPCC (adjusted average per capita cost), MSA (metropolitan statistical area), HSA (health service area). If an MSA or HSA is divided by state borders, the part in each state is a distinct payment area. Statewide rural areas are counties in the same state lying outside MSAs.

Source: MedPAC analysis of county-level fee-for-service spending and other data from CMS.

One consequence of larger payment areas is that they would reduce AAPCCs for some counties and increase them for others. We estimate that 43 percent of beneficiaries live in counties that would have lower AAPCCs under the larger payment area, 37 percent live in counties that would have higher AAPCCs, and 20 percent live in counties that would have the same AAPCC.

Evaluating alternative payment area definitions

The statistical analysis in the previous section showed that larger payment areas have clear advantages and are preferable to the county definition. In this section, we address the question: Given that larger payment areas are better than the county definition, what is the best method for grouping counties to obtain the best payment areas?

We evaluate the three larger payment area alternatives described on pages 45–46, basing our evaluation on four criteria:

- Will CMS and plans face substantial burdens in collecting the data necessary to determine plan payments?
- Will payment areas have enough beneficiaries to obtain reliable AAPCCs?
- How well do payment areas match the market areas that plans serve?
- Would payment areas be too large to be fairly homogeneous in terms of costs of serving beneficiaries?

Will CMS and plans face substantial burdens from data collection?

Because the three alternatives that we considered use the county as their building block, neither CMS nor plans would have any additional burden from collecting the data necessary to determine plan payments. Also, plans often use counties as the building block for their service areas. Therefore, our use of counties as the basis for building payment areas has some favorable attributes.

Will the three alternatives have enough beneficiaries?

Relative to the county definition, all three alternatives would tend to increase the number of Medicare beneficiaries in payment areas (Figure 2-4). Therefore, each alternative would increase the stability of AAPCCs. For example, when we consider the distribution of the number of beneficiaries among payment areas, the county at the 10th percentile had 809 beneficiaries in 2002. In contrast, the MSA/statewide rural area definition had more than 9,200 beneficiaries at the 10th percentile, HSAs had 2,700 beneficiaries, and the MSA/HSA definition had 2,600. The MSA/statewide rural area definition had the highest number of beneficiaries because statewide rural areas often encompass more counties than MSAs and HSAs.

How well do payment areas match plan market areas?

Ideally, payment areas should perfectly match the geographic areas that plans serve (plan market areas). We have identified two measures that can give us a sense of how well a payment area definition matches plan market areas:

- If one county of a payment area is served by at least one plan, are all counties in the payment area served by at least one plan? For example, if a payment area has two counties and we know that at least one plan serves one of those counties, we ask: Does at least one plan serve both counties? Note that the same plan does not have to serve all counties of a payment area.
- If a plan serves at least one county in a payment area, does it serve the entire payment area?

Under both measures, if some parts of a payment area are covered but other parts are not, the payment area might not accurately represent plan market areas. In our analysis,

TABLE 2-2

How payment areas compare with market areas of Medicare Advantage and private-sector plans

	If one county in an area is served by plans, likelihood all counties are served		If a plan serves one county in an area, likelihood it serves all counties	
Payment area definition	**Private-sector plans**	**MA plans**	**Private-sector plans**	**MA plans**
MSA/HSA	94.9%	69.6%	69.8%	59.4%
MSA/Statewide rural area	93.8	65.6	63.4	52.5
HSA	93.3	49.0	55.4	41.8

Note: MA (Medicare Advantage), MSA (metropolitan statistical area), HSA (health service area). If an MSA or HSA is divided by state borders, the part in each state is a distinct payment area. Statewide rural areas are counties in the same state lying outside MSAs.

Source: MedPAC analysis of data from CMS and InterStudy.

we considered how well our three proposed alternatives match the market areas of coordinated care plans that participate in MA as well as the market areas of HMOs in the private sector.

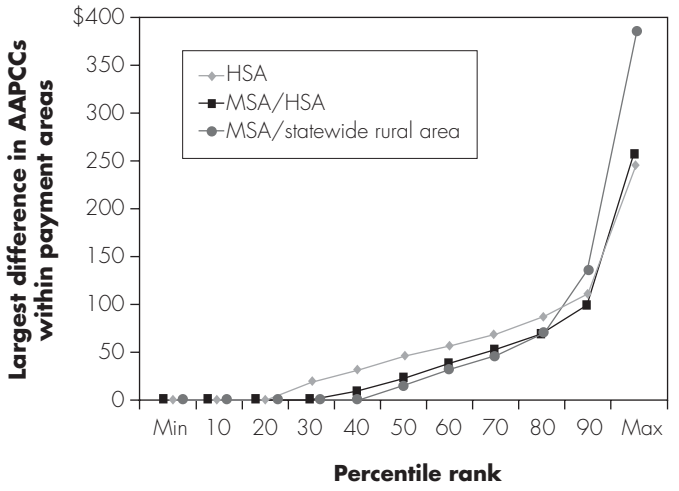
Among the three alternatives, the MSA/HSA definition performs the best, when we consider market areas of MA plans and those of private-sector HMOs. The HSA definition performs the worst (Table 2-2, p. 49).

Would payment areas be too large?

We want payment areas that are large enough to obtain stable AAPCCs, but small enough so that the cost of serving beneficiaries is fairly homogeneous. We measured the homogeneity of cost under each alternative as the difference between the largest and smallest AAPCCs among counties in the same payment area. When we consider the payment areas within each definition that show the largest differences (90th percentile and higher), the MSA/statewide rural area definition has the largest differences relative to the other definitions (Figure 2-5). We are not surprised by this result because statewide rural areas can encompass relatively large geographic areas, increasing the likelihood of large differences in per capita spending.

FIGURE 2-5

Geographic differences in AAPCCs are greater in larger payment areas



Note: AAPCC (adjusted average per capita cost), HSA (health service area), MSA (metropolitan statistical area). If an MSA or HSA is divided by state borders, the part in each state is a distinct payment area. Statewide rural areas are counties in the same state lying outside MSAs.

Source: MedPAC analysis of county-level fee-for-service spending and other data from CMS.

Payment area recommendations

We do not consider any of the three alternatives an optimal payment area. This is to be expected; no single method of grouping counties can perfectly match all plan market areas because markets differ.

Despite the shortcomings of our alternatives, the Congress can improve payment areas over the county definition by making the following changes:

- MSAs should serve as the payment area for urban counties.
- Payment areas for rural counties should be collections of counties that represent health care market areas for Medicare beneficiaries. An example is the HSAs we examined in this report.

We prefer MSAs to HSAs for urban counties because MSAs match plan market areas better (Table 2-2, p. 49).[7] For rural counties, we prefer to use payment areas that are smaller than statewide rural areas because statewide rural areas often have high variations in the cost of serving beneficiaries. This could make them unattractive to plans and unnecessarily hinder plans from serving rural areas. The Secretary generally should require plans to serve entire payment areas, irrespective of the payment area definition. But plans also should have the opportunity to obtain waivers allowing them to serve only specific portions of a payment area if they can show that it is difficult to form provider networks throughout the payment area.

If the Congress chooses to implement our recommended payment area definition, three issues should be considered before the Secretary puts it into practice. First, the Secretary should confirm whether plans have any concerns that a few payment areas have unusual characteristics that the Secretary should address. Second, if an MSA is so large that most MA local plans do not serve all of it, the Secretary could consider dividing the MSA into smaller groups of counties. Third, MA plans are facing substantial changes in the near future, including a new payment system based on plan bids and a prescription drug benefit. It may be prudent to allow plans time to become accustomed to these other changes before introducing new payment areas.

The effect of this recommendation on plan participation and beneficiary enrollment in MA plans is uncertain. Relative to the county definition, the MSA/HSA definition tends to increase plan payments in counties that currently have low county rates, which could increase plan participation and beneficiary enrollment. In contrast, the MSA/HSA definition tends to decrease payments in counties with high rates, which could decrease plan participation and beneficiary enrollment. Consequently, we cannot predict the effect that changes in beneficiary enrollment would have on overall program spending.

Finally, no payment area definition is perfect. One problem presented by the MSA/HSA definition is that payment areas may have noncontiguous counties. Nevertheless, the MSA/HSA definition is better than the current county definition. If the MSA/HSA definition does create noncontiguous payment areas, the Secretary could examine those situations to determine whether he should break up an HSA into smaller groups of counties.

RECOMMENDATION 2A

The Congress should establish payment areas for Medicare Advantage local plans that have the following characteristics:

- **Among counties in metropolitan statistical areas, payment areas should be collections of counties that are located in the same state and the same metropolitan statistical area.**
- **Among counties outside metropolitan statistical areas, payment areas should be collections of counties in the same state that are accurate reflections of health care market areas, such as health service areas.**

RATIONALE 2A

Counties are often too small to serve adequately as payment areas for MA local plans. However, counties should be the building block for larger payment areas because plans and CMS would have no additional data collection burden. Our assessment of alternatives to the county definition shows that among urban counties, MSAs are reasonably good matches for plan market areas. Among rural counties, payment areas must not be so large that the cost of providing care varies widely within payment areas. HSAs are reasonable matches to that criterion and have the additional attribute of reflecting market areas for short-term inpatient stays among Medicare beneficiaries.

IMPLICATIONS 2A

Spending

- This recommendation should have no direct effect on program spending.

Beneficiaries and plans

- The effect on plan participation is ambiguous. On the one hand, plans may decrease the areas they serve if larger payment areas sufficiently reduce opportunities for isolating payment areas in which payments are favorable relative to costs. On the other hand, plans may increase the areas they serve if payments increase sufficiently in counties that they currently do not serve. Because of the uncertain effect on plan participation, this recommendation would have an ambiguous effect on beneficiaries' access to MA plans.

We caution that the HSA definition we used in our analysis is purely for illustrative purposes. Makuc and colleagues (1991) defined HSAs using data from hospital inpatient stays that occurred in 1988. If the Congress chooses HSAs as a payment area, the Secretary should first update those HSAs and keep them up to date over time. The Secretary should use the most recent source data and make sure the updates reflect changes in service areas. The update will be a complicated process, and the Secretary should allow ample time for it to be done properly.

RECOMMENDATION 2B

The Secretary should update health service areas before using them as payment areas in the Medicare Advantage program. In addition, the Secretary should make periodic updates to health service areas to reflect changes in health care market areas that occur over time.

RATIONALE 2B

Makuc and colleagues (1991) developed the current version of HSAs using data from hospital inpatient stays that occurred in 1988. The Secretary should update HSAs to reflect changes in health care markets that have occurred since then. In addition, health care markets will continue to change, and the HSAs should receive periodic updates to reflect those changes.

IMPLICATIONS 2B

Spending

- This recommendation should have no direct effect on program spending.

Beneficiaries and plans

- This recommendation should have no effect on plan participation or beneficiaries' access to plans.

How accurately does the CMS–HCC model reflect cost differences?

The measure that we use to evaluate the accuracy of the CMS–HCC model is the predictive ratio, which indicates how well a risk adjuster predicts the costliness of a group of beneficiaries to the Medicare program. The definition of a predictive ratio for a group is the group's mean costliness predicted by a risk adjuster divided by the mean of the group's actual costliness. If a risk adjuster predicts a group's costliness perfectly, predicted costliness equals actual costliness and the predictive ratio equals 1.0. But if a risk adjuster overpredicts a group's costliness, the predictive ratio will be greater than 1.0. Alternatively, if a risk adjuster underpredicts a group's costliness, the predictive ratio will be less than 1.0. In summary, the closer a predictive ratio is to 1.0, the better the risk adjuster has performed.

We based the predictive ratios in our analysis on predicted and actual costliness in 2002. The data that we used to obtain predicted and actual costliness are from administrative and claims information from a random sample of 5 percent of beneficiaries in FFS Medicare. We used the same version of the CMS–HCC that CMS has used in 2004 and 2005.

In our analysis, we grouped beneficiaries using characteristics that reflect either good or bad health. These characteristics include:

- quintile of costliness in 2001;
- number of hospital inpatient stays in 2001; and
- conditions diagnosed in 2001, including alcohol or drug dependence, diabetes with complications, diabetes without complications, congestive heart failure, acute myocardial infarction (AMI), chronic obstructive pulmonary disease, unspecified stroke, cerebral hemorrhage, and hip fracture.

For each of these groups, we compared the predictive ratios from the CMS–HCC to predictive ratios from a model similar to the demographic system. We chose not to use the actual demographic system because some of the data used in that model—such as institutional status—are difficult to obtain. Instead, we chose a model that uses beneficiaries' age and sex to predict their costliness to the Medicare program. Other researchers have used the age/sex model in several studies as a point of reference for the performance of other risk-adjustment models (Pope et al. 2000, Pope et al. 1999, Ellis et al. 1996).

TABLE 2-3

CMS–HCCs better predict beneficiaries' costliness than a demographic model

Beneficiary group	Predictive ratios from two risk adjusters: CMS–HCCs	Age/Sex
Quintile of costliness in 2001		
Lowest	1.34	2.53
Second	1.30	1.96
Third	1.19	1.47
Fourth	0.98	0.96
Highest	0.83	0.44
Number of inpatient stays in 2001		
Zero	1.07	1.38
One	0.96	0.65
Two	0.92	0.49
Three or more	0.80	0.29
Conditions diagnosed in 2001		
Alcohol/drug dependence	0.99	0.39
Diabetes w/complications	0.99	0.44
Diabetes w/o complications	0.99	0.72
Congestive heart failure	0.90	0.50
Acute myocardial infarction	0.98	0.64
COPD	0.93	0.67
Unspecified stroke	1.03	0.79
Cerebral hemorrhage	1.09	0.65
Hip fracture	1.08	0.80

Note: CMS–HCCs (CMS–hierarchical condition category); COPD (chronic obstructive pulmonary disease). A predictive ratio for a group of beneficiaries is the mean of their costliness predicted by a risk-adjustment model divided by the mean of their actual costliness. The age/sex model uses beneficiaries' age and sex to predict costliness. All conditions listed are used in the CMS–HCC model.

Source: MedPAC analysis of 5 percent sample of beneficiaries participating in fee-for-service Medicare in 2001 and 2002.

Our results show that in each group, predictive ratios are closer to 1.0 under the CMS–HCC than under the age/sex model (Table 2-3). This indicates the CMS–HCC does a better job than the age/sex model of predicting the costliness of beneficiaries who are in good health and those who are in bad health.

However, the CMS–HCC leaves room for improvement. For example, the predictive ratio is 1.34 for beneficiaries in the lowest quintile of costliness in 2001 and 0.83 for beneficiaries in the highest quintile, indicating the CMS–HCC overpredicts the costliness of beneficiaries who are in good health and underpredicts for those who are in poor health. CMS will introduce an improved version of the CMS–HCC in 2007 that should reduce these prediction errors.

A final issue is that CMS will use the CMS–HCC to predict how much MA enrollees would cost Medicare if they were enrolled in the FFS program. This can be a problem if Medicare's goal is to pay MA plans accurately for the costs plans incur in providing care to their enrollees and the relative costs of treating conditions are markedly different between FFS Medicare and MA plans. For example, the relative cost of treating a beneficiary who had an AMI to a beneficiary who has no conditions could be different between the FFS and MA programs. Conversely, if FFS Medicare and MA plans have the same relative costs in treating conditions, this issue is irrelevant.

Some observers have found little or no difference between health care delivery systems in terms of the relative costs of treating conditions. But to definitively determine whether relative costs are different or similar between MA plans and FFS Medicare, we must have data on the costs that plans incur in providing care to individual enrollees. These data are not available to Medicare, but CMS might wish to explore this issue by collecting the necessary data from one or more MA plans. Those that pay their providers on an FFS basis would be less burdened than other plans in compiling such a database. ■

Endnotes

1 The measures of variation include the standard deviation, which is the square root of the variance; the coefficient of variation, which is the standard deviation divided by the mean of the distribution; and the average of the absolute differences from the mean.

2 We also estimated the variation in AAPCCs attributable to input prices and the variation due to IME, GME, and DSH payments. We found that adjusting for input prices reduces the variation by about 15 percent and adjusting for differences in special payments to hospitals reduces the variation by about 8 percent. When we adjust for these factors simultaneously, the reduction in variation is about 15 percent, less the sum of the individual effects—23 percent. This occurs because input prices and special payments to hospitals interact in such a way that their impacts are mitigated when taken together.

3 By law, state governors can request that payment areas in their states be groups of counties rather than single counties, but none have done so. The law allows three possibilities: (1) making the entire state one payment area; (2) grouping counties that are located in metropolitan statistical areas (MSAs) into payment areas and grouping counties that are not located in MSAs into a single payment area; and (3) grouping noncontiguous counties.

4 Our definitions of urban and rural are based on definitions of metropolitan and micropolitan statistical areas created by the Office of Management and Budget (OMB) in 2004. OMB grouped counties into metropolitan statistical areas, micropolitan statistical areas, and rural areas. We define urban counties as those that are located in metropolitan statistical areas, and we define rural counties as those that are located in either micropolitan statistical areas or rural areas.

5 The basis for this decision was results from work with health care commuting areas (HCCAs), which were developed in 1976 using data from 1968 to 1970. Makuc and colleagues decided it was reasonable for the number of HSAs to be about equal to the number of HCCAs. They found that the HCCAs performed well as health service areas and there had not been a major change in the number of hospital beds between 1970 and 1988 (where 1988 is the year of their data).

6 Earlier, we used five-year averages to analyze the variation in AAPCCs among counties. We used four-year averages to analyze annual changes because we have data from 1998 through 2002. We used data from 1998 through 2001 to obtain four-year averages for 2001 and data from 1999 through 2002 to obtain four-year averages for 2002.

7 We also examined the 20 largest metropolitan areas to see how well the MSA/HSA definition and the HSA definition match the areas served by HMOs participating in the Federal Employees Health Benefits (FEHB) Program. In general, the MSA/HSA definition performs better because the HSA definition often includes more rural counties that the FEHB Program plans do not serve.

References

Ellis, R. P., G. C. Pope, L. I. Iezzoni, et al. 1996. *Diagnostic cost group (DCG) and hierarchical coexisting conditions (HCC) models for Medicare risk adjustment.* Waltham, MA: Health Economics Research, Inc. April 26.

Fisher, E. S., D. E. Wennberg, T. A. Stukel, et al. 2003. Implications of regional variations in Medicare spending, part 1: The content, quality, and accessibility of care. *Annals of Internal Medicine* 138, no. 4 (February 18): 273–287.

Makuc, D. M., B. Haglund, D. D. Ingram, et al. 1991. *Vital and health statistics: Health service areas for the United States*, series 2, no. 112. Hyattsville, MD: National Center for Health Statistics. November.

Medicare Payment Advisory Commission. 2003. *Report to the Congress: Variation and innovation in Medicare*. Washington, DC: MedPAC.

Medicare Payment Advisory Commission. 2001. *Report to the Congress: Medicare payment policy*. Washington, DC: MedPAC.

Pope, G. C., R. P. Ellis, A. S. Ash, et al. 2000. *Diagnostic cost group hierarchical condition category models for Medicare risk adjustment*. Waltham, MA: Health Economics Research, Inc. July 31.

Pope, G. C., C. F. Liu, R. P. Ellis, et al. 1999. *Principal inpatient diagnostic cost group models for Medicare risk adjustment*. Waltham, MA: Health Economics Research, Inc. February 24.

Wennberg, J. E., and M. M. Cooper. 1999. *The Dartmouth atlas of health care in the United States: A report on the Medicare program*. Chicago: AHA Press.