REVISIONS TO MEDICARE'S DISPROPORTIONATE SHARE PAYMENT POLICY TO INCORPORATE BAD DEBT AND CHARITY CARE

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EXECUTIVE SUMMARY

This study investigates the impact of possible changes to the Medicare disproportionate share (DSH) payment policy, designed to incorporate information on the hospital's uncompensated care burden as well as to improve the payment formulae. We compute DSH payments for individual study hospitals under six alternative models, and compared these to the payments now made under current law. For each alternative, we examine the overall financial impact by type of hospital and the characteristics of hospitals that would experience either large payment increases or decreases relative to the current system. These analyses are intended to help policymakers evaluate the likely impact of revising the DSH payment methodology.

Description of Medicare's Disproportionate Share Payment Policy

Under Medicare's prospective payment system (PPS) for acute-care hospitals, higher payments are made to hospitals that treat a relatively high – or disproportionate – share of low-income patients. Originally justified as a way to compensate hospitals for the purportedly higher cost of serving low-income patients, the DSH policy has come to be viewed as serving the larger goal of protecting access to care for Medicare beneficiaries and low-income patients by providing additional financial resources to the targeted hospitals. When considered in the context of protecting access to care, the DSH payment policy becomes particularly salient for rural hospitals, which may be the only source of acute medical care in their area.

The additional DSH payments made to a hospital depend on its disproportionate share patient percentage (DPP), which currently is the sum of two ratios: (1) the number of Medicare SSI patient days relative to all Medicare days and (2) the number of Medicaid days relative to the total number of days. Hospitals with a DPP value above 15 percent qualify to receive DSH payments, computed as a percentage 'add on' to their base PPS payments. The add-on percent is determined by a set of formulae that consider the DPP and the extent by which it exceeds the 15-percent threshold. Currently, the add-on percent is capped at 12 percent for small urban hospitals and most rural hospitals, but is unlimited for urban hospitals with more than 100 beds, rural hospitals with more than 500 beds, and rural referral centers (RRCs). Actual DSH payments are computed by applying the add-on percent to the PPS operating payment made to the hospital for the Medicare discharge. Because the add-on percent applies to PPS payments, the total DSH payments received by a hospital are a function of its volume and mix of Medicare patients.

Shortcomings of the Current DSH Payment Methodology

Historically, the DSH payment policy was designed primarily to benefit urban hospitals. Most rural hospitals had to meet significantly higher qualifying thresholds than their urban counterparts, and payments were more generous for urban facilities than for rural facilities among hospitals that qualified. Additionally, most rural facilities faced a lower cap on the DSH add-on percent. The Benefits Improvement and Protection Act of 2000 and the Medicare Prescription Drug and Modernization Act of 2003 (MMA) rectified several of these urban/rural inequities by standardizing the qualifying threshold at 15 percent for all hospitals, applying

uniform payment formulae to all hospitals, and raising the cap faced by most rural hospitals to the same level as applied to small urban hospitals. At this point, the only differential treatment of urban and rural facilities that remains pertains to the cap on the DSH add-on percent, as described above.

In addition to the now-rectified problems with different qualifying thresholds and payment formulae for different types of hospitals, the Medicare Payment Advisory Commission (MedPAC) has noted a number of other issues with the DSH payment system, which remain even after the recent legislative changes (1998, March 2000). Most critically, the DPP measure fails to account for all care provided to low-income patients, relying instead on the share of Medicaid days to total days as a proxy for the amount of care provided to all non-elderly, low-income patients. Since Medicaid eligibility rules vary dramatically from state to state, however, there are corresponding state differences in the size of the uninsured population and the amount of uncompensated care hospitals are likely to have to provide. Hospitals in states with restrictive Medicaid programs would probably have a lower ratio of Medicaid days to total days, but be providing a higher amount of uncompensated care – which is not accounted for in the current DPP formula. Furthermore, MedPAC has demonstrated that even within states, a hospital's Medicaid share is not necessarily directly correlated with its uncompensated care burden.

Other issues with the current DSH payment system center around concerns with the formulae used to compute the DSH add-on percents. To begin, the payment formulae incorporate a discontinuity, or 'notch' effect, such that hospitals with a DPP value just above 15 percent receive at least a 2.5 percent DSH add-on, while those with a DPP just below 15 percent receive nothing. This formulation provides strong incentives for hospitals at the margin to modify their behavior so their DPP value edges above the qualifying threshold. Additionally, the payment formulae provide for marginally more generous DSH add-on percents at higher DPP values. MedPAC has argued that these progressive formulae evolved in an attempt to counteract the flaws in the DPP measure and would no longer be necessary once the DPP measure better accounts for all care provided to low-income and uninsured patients. Finally, the current formulae still cap the DSH add-on percent for some categories of hospitals, while permitting unrestricted add-on percents for other types of hospitals.

Recommended Features of a Revised DSH Payment Methodology

To overcome these shortcomings, the Commission has recommended adoption of a DPP measure that includes not only care provided to SSI Medicare and Medicaid patients, but also care provided to uninsured and underinsured patients (as captured by uncompensated care) and to patients covered through state/local indigent care programs. This revised measure should be based on costs, rather than days, and should reflect both inpatient and outpatient costs. As is currently the case, the DSH payment system should continue to target payments to facilities providing the most care to low-income patients by limiting receipt of DSH payments to only hospitals with a DPP value above a pre-determined threshold. Concurrent with the recommended change to the DPP measure, the Commission also recommends adoption of a DSH add-on percent formula that results in a gradual and consistent rise in DSH payments as the DPP value climbs above the threshold – eliminating the notch effect and progressive nature of the current formulae.

MedPAC also has been a strong proponent of having a single formula for all hospitals (as is now the case under the MMA rules), and feels that DSH payments should continue to be made as an add-on to payments for each Medicare discharge, so that the financial assistance afforded by these Medicare expenditures is targeted to hospitals used most heavily by the Medicare population. Finally, analyses by Commission staff have recognized the need to retain a cap on DSH payments in the interest of cost control (MedPAC, July 2000). Instead of the current method of capping the DSH add-on percent at a uniform rate for all hospitals that face the cap, however, the Commission has discussed establishing a hospital-specific cap that is expressed as a percent of the hospital's total patient care revenue (MedPAC, 2001). MedPAC suggests that this cap be pegged to the ratio of DSH payments to total patient care revenue in the traditional safety-net hospitals in order to prevent windfall gains by hospitals that are not large safety net providers but that happen to have large Medicare patient populations. Our simulation of alternative DSH payment methods incorporates as many of these recommendations as possible.

Data

All data for this study are for fiscal year 2002. Key data elements were drawn from the Medicare Hospital Cost Report File, the PPS Impact File, the DSH File, and the Provider of Services File, all obtained from the Centers for Medicare and Medicaid Services. Information on the hospital's total gross patient revenue, Medicare and Medicaid gross patient revenue, bad debt expenses, and charity care charges was derived from audited hospital financial statements obtained from nine states.[1] Information on the Urban Influence code of the county in which the hospital is located was obtained from the Area Resource File. We also used a current listing of critical access hospitals (CAHs) obtained from the University of North Carolina Sheps Center to identify hospitals that were CAHs for all or part of FY2002; these facilities were removed from the analysis file since they are not paid under PPS and do not receive DSH payments. The final analysis file contained 954 hospitals.

Calculation of Disproportionate Share Payments under Current Law

We began by using the FY2002 data to simulate the DSH payments hospitals would have received if the current payment rules (resulting from the 2003 MMA) had been in effect at that time. The hospital's DPP was based on the following formula:

DPP = (Medicare SSI days / Medicare days) + (Medicaid days / total days).

These DPP values were then used in the MMA payment formula, to compute a DSH add-on percent for each hospital. This add-on percent was applied to the hospital's total PPS operating payments net of outlier payments, obtained from the Cost Report, to determine the total DSH payments made to the facility. The sum of DSH payments across all hospitals in the study population gave the total amount of Medicare funds being spent on DSH payments in these states under the MMA rules, and served as the budget neutrality constraint in our modeling of alternative proposals.

[1] The nine study states were California, Connecticut, Florida, Iowa, Texas, Virginia, Washington, West Virginia, and Wisconsin.

Calculation of Disproportionate Share Payments under Alternative Proposals

We modeled six alternative proposals. All were implemented within the budget neutrality constraint, and all began by using the following formula to compute the hospital's DPP:

DPP = {(Medicare Gross Patient Revenue * Medicare SSI Ratio) +
Medicaid Gross Patient Revenue +
Bad Debt Expenses +
Charity Care Revenue Foregone} / Total Gross Patient Revenue *100

This formulation is consistent with MedPAC's recommendations to incorporate uncompensated care data into the measure (captured by the bad debt and charity care variables), to express the measure in terms of costs rather than days, and to consider both inpatient and outpatient costs (since the state financial data represent both inpatient and outpatient settings). The use of gross patient revenue figures, which are the same as gross charges, is an acceptable proxy for a cost-based measure since the hospital's cost-to-charge ratio must be the same for all types of patients. Contrary to MedPAC's recommendation regarding the DPP measure, we were unable to include the costs of caring for patients covered by other state and local indigent care programs due to the unavailability of consistent data on these populations across our study states.

Next, we examined the distribution of DPP values across all study hospitals in order to identify the values associated with each decile of the distribution. These values are the thresholds that would permit 10 percent of hospitals, 20 percent of hospitals, and so on, to qualify for DSH payments. A higher DPP value is associated with a lower proportion of qualifying hospitals, since fewer hospitals have a DPP value above this level.

To compute the DSH add-on percent (AOP) paid to qualifying hospitals, we used the following formula, which makes the add-on percent directly proportional to the degree to which the hospital's DPP value exceeds the threshold, as recommended by MedPAC:

DSH Add-On Percent = (DPP – Threshold) * PCT

PCT is the conversion factor that preserves budget neutrality given the threshold value being modeled and the distribution of DPP values; this value was determined through iteration, and varies for each model and for each threshold.

The add-on percent was then applied to the hospital's total PPS operating payments (net of outlier payments) in order to calculate the additional payments made to the hospital in the form of DSH payments (the Add-On Amount, or AOA):

DSH Add-On Amount = Add-On Percent * PPS Operating Payment

Finally, comparison of the hospital's sum of PPS operating and DSH payments made under the MMA rules with the payments made under the alternative model indicates the change in total payments received by the hospital as a result of adopting a new DSH payment method.

Overview of Modeling Options

Option	Model Features
Option 1: Basic Model	AOP = (DPP – Threshold) * PCT AOA = AOP * PPS Operating Payments
Option 2: Cap on AOP	Option 1, but AOP is capped at 12 percent Applies only to those hospitals capped under MMA rules
Option 3: Cap on AOA	Option 1, but AOA is capped at 1.75 percent of hospital's total gross patient revenue Applies to all hospitals
Option 4: Basic Model, with Hold Harmless Protections	Option 1, but RRCs and SCHs must receive at least the same amount in DSH payments as they are receiving under the MMA rules
Option 5: Cap on AOP, with Hold Harmless Protections	Option 2, but RRCs and SCHs must receive at least the same amount in DSH payments as they are receiving under the MMA rules
Option 6: Cap on AOA, with Hold Harmless Protections	Option 3, but RRCs and SCHs must receive at least the same amount in DSH payments as they are receiving under the MMA rules

The above formulation constitutes the basic model of Option 1. As summarized in the above table, Options 2 and 3 built upon this basic model by incorporating caps on the DSH payments. In Option 2, we adopted the same 12 percent cap on the DSH add-on percent that is part of current law; this cap applied only to hospitals currently facing the cap. Option 3 experimented with MedPAC's alternative formulation of the cap by limiting the total DSH payments that any hospital may earn to 1.75 percent of its total gross patient revenue. The 1.75 percent figure corresponds to the mean ratio of DSH payments to gross patient revenue under the current payment rules for study hospitals in the top quartile of the distribution of DPP values. These hospitals were chosen as the basis for computing this cap due to the fact that they provide appreciable amounts of care to low-income and uninsured patients.

Options 4 through 6 replicated the features of Options 1 through 3, respectively, but added a hold harmless feature for RRCs and sole community hospitals (SCHs). Under this stipulation, RRCs and SCHs must receive at least as much in DSH payments under the new formulation as they are receiving under the current rules. This protection includes enabling these facilities to receive DSH payments even if their DPP calculated under the new rules does not exceed the requisite qualification threshold.

RESULTS

Selection of Qualifying Threshold

The first step in analyzing the likely impact of any of the DSH payment options is to determine the threshold value that will be used to determine qualification and compute the add-on percent. Ultimately, this choice is a policy decision – driven by considerations about the number and

types of hospitals one would like to see receiving DSH payments and by the way DSH payments would be distributed across qualifying hospitals. Our analyses of the characteristics of qualifying hospitals, the mean payment changes expected by different types of hospitals, and the number and characteristics of hospitals that could expect either large payment gains or losses suggest that a threshold that would permit 40 to 70 percent of hospitals to receive DSH payments would be appropriate. Restricting DSH payments to less than 40 percent of hospitals would result in very large gains for public teaching hospitals, provide larger gains to urban hospitals than to rural hospitals (and yield net losses for rural hospitals under some payment scenarios), and raise the proportion of large losers at the expense of large winners. Conversely, permitting more than 70 percent of hospitals to qualify would disadvantage the public teaching hospitals that have traditionally been the backbone of the safety net system and hospitals in large metropolitan areas, while not providing significant additional help to rural hospitals under most payment options. These very inclusive thresholds would also tend to reduce the number of large winners relative to large losers. While thresholds in the 40- to 70-percent range would be defensible, a convincing case could be made for further narrowing the range so that 50 to 60 percent of hospitals qualify. This range is consistent with MedPAC's prior recommendations regarding the qualifying threshold (1998, March 2000).

Mean Change in PPS Payments under the Alternative Payment Options Relative to Current Law

On average, hospitals would expect the basic alternative DSH methodology represented by Option 1 to increase their PPS payments by anywhere from 3.0 to 4.5 percent, depending on the qualification threshold chosen, and gains by rural hospitals would outpace gains by urban hospitals throughout the 40- to 70-percent threshold range. The largest gains are consistently experienced by hospitals with the fewest beds and the lowest margins, and by public hospitals – particularly those located in an urban area and those with a teaching mission. When examined by the characteristics that play a role in the calculation of DSH payments under the MMA formulation, small urban hospitals, SCHs, and rural hospitals of all sizes would expect the largest increase in PPS payments if Option 1 were implemented. These gains are due to the fact that these categories of hospitals face a cap on add-on percents under the current rules, which is no longer present in Option 1.

The re-introduction of the 12 percent cap (in Option 2) erases the gains made by these categories of hospitals, to the benefit of RRCs and larger urban hospitals. At the more restrictive end of the threshold range, rural and small hospitals would now expect a decrease in total PPS payments under Option 2. Only as the threshold is relaxed and additional small and rural hospitals qualify for DSH payments, does Option 2 begin to provide a modest boost in PPS income for these facilities. Even with the caps, however, Option 2 continues to provide the largest payment increases to the hospitals in the worst financial position. And, since so few public teaching hospitals are subject to the 12 percent cap, implementing Option 2 in a budget neutral manner provides these hospitals with even larger payment increases than the already significant gains received under Option 1.

Capping a hospital's total DSH payments at no more than 1.75 percent of its total gross patient revenue (Option 3) has the effect of lowering average gains for most, but not all, types of hospitals. Overall, rural hospitals would do somewhat better under Option 3 than their urban

counterparts. However, among small hospitals, larger gains could be expected for urban facilities than for rural ones. Rural hospitals with a SCH designation would fare relatively well under Option 3, but a RRC designation would not impart similar advantages. Public hospitals, in general, and urban public hospitals, in particular, would see large payment gains under Option 3, as would public teaching hospitals.

The hold harmless provision for RRCs and SCHs incorporated into Options 4 through 6 necessarily reverses losses or imparts larger gains for these facilities relative to their situation without the hold harmless protection. Due to the budget neutrality constraint, these gains have come at the expense of other types of hospitals – including rural hospitals without these special payment classifications. However, since RRCs and SCHs represent less than 17 percent of our study population, the impact of holding these facilities harmless has not had a significant impact on the general pattern of results noted earlier for Options 1 through 3.

Characteristics of Hospitals that are Large Winners or Large Losers

In addition to considering the mean percent change in PPS payments, which blends the experiences of all hospitals into a single number and may mask the extremes, it is important to examine the number and types of hospitals that would experience either significant payment decreases or increases under each option. For the purpose of this analysis, hospitals experiencing at least a 10 percent increase (decrease) in payments were identified as large winners (losers).

Depending on the threshold, the number of large winners under Option 1 is anywhere from 2.5 to 6 times greater than the number of large losers. Throughout the 40- to 70-percent threshold range considered, urban hospitals – and particularly those with more than 100 beds – are disproportionately more likely to be large losers. The money lost by these facilities is being reallocated to smaller urban hospitals, SCHs, and other rural hospitals, including those in remote rural counties as well as those in counties adjacent to a metropolitan area. As noted earlier, the appreciable gains by these types of hospitals are due to the fact that their DSH add-on percent is not capped under Option 1.

Relative to private voluntary and for-profit hospitals, public hospitals are disproportionately represented among the large winners under Option 1. Urban public hospitals and those with a teaching mission receive a bigger payment boost at more restrictive thresholds, while rural public hospitals fare better under less restrictive thresholds. Option 1 is also more likely to provide large gains to the hospitals in the worst financial position. Finally, the large winners tend to derive a much greater share of their total revenue from Medicaid, and to provide above-average amounts of uncompensated care and care to low-income Medicare patients. These patterns of care result in much higher DPP ratios for the large winners, not only making them more likely to qualify for DSH payments, but also resulting in a higher DSH add-on percent in this unconstrained model.

Imposing a 12 percent cap on DSH add-on percents for small urban hospitals, SCHs, and other rural hospitals (Option 2) has little impact on the types of hospitals that are large losers, but greatly reduces the likelihood that the hospitals facing the cap will be among the large winners.

Instead, as payments in the budget neutral model are re-distributed from the hospitals facing the cap, large urban hospitals, hospitals in large metropolitan areas, for-profit and urban public hospitals, and teaching hospitals are now much more likely be among the large winners. The Option 2 payment model continues to provide relatively more financial assistance to hospitals with great financial need.

Imposing a cap on DSH payments relative to total gross revenue (Option 3) redistributes large gains away from rural hospitals to urban hospitals – especially to hospitals in large metropolitan counties and urban facilities with more than 100 beds. Public teaching hospitals fare better under Option 3 than Option 1, while non-teaching hospitals (a category that includes most rural facilities) are more likely to experience large losses and less likely to experience large gains when the cap on DSH payments is imposed. This finding illustrates the fact that this type of cap is specifically designed so that hospitals with large Medicare shares (e.g., many rural hospitals) do not experience windfall gains at the expense of hospitals that have traditionally been viewed as core safety-net providers. Option 3 continues to provide disproportionately more gains to hospitals with the greatest financial need, but these gains are less concentrated among the low-margin hospitals than they would be under the uncapped model represented by Option 1. Finally, whereas the large winners under Option 1 and Option 2 had a much higher mean DPP value than the large losers – indicating effective targeting of DSH payments – the mean DPP values under Option 3 are much more similar for the large winners and losers. Thus, under this option, hospitals with high DPP values may nonetheless face significant losses due to the overall cap on DSH payments.

The hold harmless protection of Options 4 through 6 has necessarily kept RRCs and SCHs from being among the large losers (indeed, from incurring any losses whatsoever), and resulted in small increases in the probability that large losers will be drawn from other categories of hospitals (especially urban facilities). These marginal changes are quite small, however, and most often attributed to changes in the results for only a few hospitals. Thus, regardless of the underlying payment model, adding a hold harmless protection would help RRCs and SCHs without having a dramatic negative effect on DSH payments for other categories of hospitals. This result is possible because only one in every six study hospitals is eligible for the hold harmless provision, and even fewer actually receive protection under this provision.

Discussion

Despite the flurry of interest in the late 1990s and early 2000s in revising the Medicare DSH payment system, and despite provisions in the Balanced Budget Refinement Act of 1999 mandating the collection of data on hospitals' charity care and bad debt, little has happened in recent years to advance this issue on the Medicare policy agenda. This study has illustrated how uncompensated care data could be incorporated into a revised DSH payment system and explored the distributional impacts of several alternative payment formulae. By and large, these simulation results indicate that the public teaching (and mostly urban) hospitals that are the backbone of the traditional safety net system would fare well under all of the options considered. All options also tend to help the hospitals in the greatest financial need, as measured by their total margin (computed prior to any change in the DSH payment system). Thus, any of the DSH

options we have modeled would further the goal of protecting beneficiary access to care by providing financial assistance to hospitals at the greatest risk of closure.

Not surprisingly, implementing the new DSH payment formulae without a cap on add-on percents (Option 1) would significantly increase the DSH payments made to those categories of hospitals now facing the cap, which includes most rural hospitals as well as small urban facilities. These gains disappear when the cap is reintroduced (Option 2), and at more restrictive qualifying thresholds, most rural and small hospitals would expect their total PPS payments to be lower under the new system as fewer of these facilities qualify for DSH payments. Using a hospital-specific cap that limits total DSH payments as a percent of gross patient revenue (Option 3) does have the intended impact of preventing large windfall gains by hospitals that are not among the top providers of care to low-income uninsured patients (e.g., rural hospitals with large Medicare patient populations). However, the average rural hospital would still fare better than the average urban hospital under this scenario.

Finally, the hold harmless protections we included for RRCs and SCHs in Options 4 through 6 necessarily assisted the targeted hospitals. Although the budget neutrality constraint means that these protections came at the expense of other types of hospitals, including other rural facilities, the negative impact on these other categories of hospitals was typically small due to the relatively small number of RRCs and SCHs actually held harmless by the provisions.

These findings are subject to a number of caveats. First, the results are based on the experiences of just 9 states that could supply the necessary data. Although we were able to include a good mix of states from across the country and had adequate representation of different types of urban and rural facilities, study findings may not be generalizable to the nation. Second, other than basic data cleaning, we have not conducted any assessment of the quality of the financial data provided by the states. Third, also due to data limitations, we were unable to implement fully MedPAC's recommendation regarding the inclusion of patients treated through other state and local indigent care programs. The difficulties we encountered in obtaining consistent financial data from even 9 states underscore the difficulty of collecting this information from all Medicare-certified hospitals and implementing a revised DSH system on a national basis – especially absent further federal action to mandate submission of the requisite data and promulgate rules for how the data items are to be defined.

Our results are also dependent on the specifications of the options we have chosen to model. Varying the way the add-on percent is calculated, imposing different caps on the add-on percent or add-on amount, applying these caps to different categories of hospitals, or protecting different categories of hospitals through hold harmless provisions, would certainly change the absolute magnitude of the results reported here for specific groups of hospitals and might also change the relative patterns of results. Finally, we would expect different results if changes to the DSH payment system are not implemented in a budget neutral manner.

REVISIONS TO MEDICARE'S DISPROPORTIONATE SHARE PAYMENT POLICY TO INCORPORATE BAD DEBT AND CHARITY CARE

1.0 STUDY PURPOSE

This study investigates the impact of long-discussed changes to the Medicare disproportionate share (DSH) payment policy, designed to incorporate information on the hospital's uncompensated care burden as well as to improve the payment formulae. DSH payments are computed under six alternative models, and compared to the payments now made under current law. For each alternative, we examine the overall financial impact by type of hospital and the characteristics of hospitals that would experience either large payment increases or decreases relative to the current system. These analyses are intended to help policymakers evaluate the likely impact of revising the DSH payment methodology.

2.0 BACKGROUND

Two years after initiation of the prospective payment system (PPS) for acute-care hospitals, Medicare began a policy of making higher PPS payments to hospitals that treat a relatively high – or disproportionate – share of low-income patients. Originally justified as a way to compensate these hospitals for the purportedly higher cost of serving low-income patients, the DSH policy has come to be viewed as serving the larger goal of protecting access to care for Medicare beneficiaries and low-income patients by providing additional financial resources to the targeted hospitals. When considered in the context of protecting access to care, the DSH payment policy becomes particularly salient for rural hospitals, which may be the only source of acute medical care in their area.

The first step in calculating DSH payments is to compute the hospital's disproportionate share patient percentage (DPP), which currently is the sum of two ratios: (1) the number of Medicare SSI patient days relative to all Medicare days and (2) the number of Medicaid days relative to the total number of days. This DPP is then compared to a pre-determined threshold value in order to determine whether the hospital qualifies to receive DSH payments. For hospitals with a DPP above the threshold, the DSH 'add-on' percent is determined by a formula that considers the DPP and the extent by which it exceeds the threshold. The add-on percent is currently capped for some types of hospitals, and unlimited for others. The final step in the DSH calculations is to apply the add-on percent to the hospital's PPS operating payment (net of any outlier payment) to determine the added dollar amount the hospital receives for the Medicare discharge. Because the add-on percent applies to PPS payments, the total DSH payments received by a hospital will be a function of its volume and mix of Medicare patients.

Historically, the DSH policy was been characterized by a complex system of payment formulae that favored urban hospitals. Most rural hospitals had to meet significantly higher thresholds than their urban counterparts in order to receive DSH payments, and payments were more generous for urban facilities than for rural facilities among hospitals that qualified. Additionally,

Table 1. Current DSH Payment Formulae

Type of Hospital	DPP Value	DSH Add-On Percent	Cap
Urban, <100 beds	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	12%
Urban, 100+ beds	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	None
Sole Community Hospital	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	12%
Rural Referral Center	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	None
Both SCH and RRC	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	None
Other rural, <500 beds	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	12%
Other rural, 500+ beds	15 - 20.2	2.5 + (0.65 * (DPP - 15.0))	
	≥ 20.2	5.88 + (0.825 * (DPP - 20.2))	None

most rural facilities faced a lower cap on their DSH payments. It is difficult to justify these types of urban/rural payment inequities if one views Medicare DSH payments as a way of ensuring access to care for all beneficiaries.

The Benefits Improvement and Protection Act of 2000 and the Medicare Prescription Drug and Modernization Act of 2003 (MMA) rectified several of these urban/rural inequities by standardizing the qualifying threshold at 15 percent for all hospitals, applying uniform payment formula to all hospitals, and raising the cap faced by most rural hospitals to the same level as applied to small urban hospitals. The formulae that have resulted from these legislative changes are presented in Table 1. At this point, the only differential treatment of urban and rural facilities that remains pertains to the cap on the DSH add-on percent. While most rural hospitals (sole community hospitals and those with fewer than 500 beds) face a cap of 12 percent, most urban hospitals (those with more than 100 beds) can earn unlimited DSH payments.

In addition to the now-rectified problems with different qualifying thresholds and payment formulae for different types of hospitals, MedPAC (1998, March 2000) has noted a number of other issues with the DSH payment system, which remain even after recent legislative changes:

- **DPP measure fails to account for all care to low-income patients** – The existing DPP ratio uses the share of Medicaid days to total days as a proxy for the relative amount of care provided to all non-elderly, low-income patients. Since Medicaid eligibility rules vary dramatically from state to state, however, there are corresponding state differences in the size of the uninsured population and the amount of uncompensated care hospitals are likely to have to provide. Hospitals in states with restrictive Medicaid programs would probably have a lower ratio of Medicaid days to total days, but be providing a higher amount of uncompensated care – which is not accounted for in the current DPP formula. Furthermore, MedPAC has demonstrated that even within states, a hospital's Medicaid share is not necessarily directly correlated with its uncompensated care burden. In short, then, the current DPP ratio is an imperfect measure of the full amount of care provided to low-income and uninsured patients.

- **DPP measure gives more weight to SSI Medicare patients** – Because the DPP ratio considers SSI Medicare days relative to all Medicare days instead of all days, low-income Medicare patients are given more weight than Medicaid patients.

- **Payment formulae are progressive** – As shown in Table 1, more generous DSH add-on percents are provided at higher DPP values. Specifically, once the DPP value rises above 20.2 percent, every percentage point increase in the DPP garners an additional 0.825 percentage point increase in the add-on percent, rather than the 0.65 percentage point increase given for DPP values between 15 and 20.2. MedPAC has argued that these progressive formulae evolved in an attempt to counteract the flaws in the DPP measure by giving higher DSH payments to hospitals providing the most care to low-income Medicare and Medicaid patients.

- **Payment formulae have a 'notch' effect** – Under the current formulae shown in Table 1, hospitals with a DPP just above 15 percent receive at least a 2.5 percent DSH add-on, while those with a DPP just below 15 percent receive no DSH payments. This formulation provides strong incentives for hospitals at the margin to modify their behavior so their DPP value edges above the qualifying threshold.

- **Cap on payments** – The current formulae still cap the DSH add-on percent for some categories of hospitals, while permitting unrestricted add-on percents for other types of hospitals.

To overcome these shortcomings, the Commission has recommended movement to a system that encompasses the following design elements (1998, March 2000):

- **DPP measure** – The measure used to capture the hospital's disproportionate share patient percent should include not only care provided to SSI Medicare and Medicaid patients, but also care provided to uninsured and underinsured patients (as captured by uncompensated care) and to patients covered through state/local indigent care programs (including state Children's Health Insurance Programs and other general assistance programs). The measure should be based on costs, rather than days. Costs can be proxied by charges (i.e., gross patient revenue) since the hospital's ratio of costs to charges must be the same for all patients. Due to the difficulty in accurately differentiating between revenue foregone through the provision of charity care and expenses related to bad debt, the uncompensated care component should include both charity care and bad debt. Likewise, due to the difficulty in disentangling inpatient and outpatient costs, the measure should be based on hospital costs from both sectors.

- **Qualifying threshold** – The DSH payment system should remain threshold-based so that DSH payments are targeted to facilities providing the most care to low-income patients. MedPAC initially recommended setting the DPP threshold so that 50 to 60 percent of all hospitals received DSH payments (1998), but subsequently indicated that a 60-percent threshold was preferable for the options they were modeling (March 2000).

- **Non-progressive formula** – The formulae for computing the DSH add-on percent no longer need to be progressive (i.e., providing a larger add-on at higher DPP levels) once the DPP measure is revised to adequately reflect the full spectrum of low-income patients.

- **Notch effect** – The formulae for computing the DSH add-on percent should not have a notch effect. Instead, the add-on percent should rise gradually and consistently as the DPP value climbs above the threshold.

- **Same formula for all hospitals** – As is now the case, MedPAC has long advocated adoption of a single formula for all hospitals as the most equitable payment method, especially in light of the policy goal of protecting access to care.

- **Cap on DSH payments** – Analyses by Commission staff have recognized the need to retain a cap on DSH payments in the interest of cost control (MedPAC, July 2000). Instead of the current method of capping the DSH add-on percent at a uniform rate for all hospitals that face the cap, however, the Commission has discussed establishing a hospital-specific cap that is expressed as a percent of the hospital's total patient care revenue (MedPAC, 2001). This recommendation recognizes that the degree to which hospitals will benefit from an increase in the DSH add-on percent is dependent on their Medicare patient share. Hospitals with very large DPP shares may qualify for a large add-on percent, but typically have a fairly low Medicare patient share, so would earn this supplement on relatively few patients. Conversely, hospitals with large Medicare shares – such as many rural facilities – would be in a position to achieve significant gains relative to their prior situation when the DSH payment formulae are liberalized. MedPAC suggests that the cap be pegged to the ratio of DSH payments to total patient care revenue in the traditional safety-net hospitals in order to prevent windfall gains by hospitals that are not large safety net providers.

- **Target assistance to hospitals used by Medicare patients** – As in the current system, DSH payments should continue to be made as an add-on to Medicare payments for each Medicare discharge. This provision means that total DSH payments will be based on the hospital's volume of Medicare patients, thereby targeting assistance to those hospitals used most heavily by the Medicare population.

Our simulation of alternative DSH payment methods incorporates as many of these recommendations as possible.

3.0 DATA AND STUDY METHODS

Creation of Analytic File

All data for this study are for fiscal year 2002. Key data elements were drawn from multiple files obtained from the Centers for Medicare and Medicaid Services (CMS), and from audited hospital financial statements obtained from nine states that make this information available. The CMS databases were:

- **Medicare Hospital Cost Report** – for financial data and information on hospital characteristics;
- **PPS Impact File** – for data on each hospital's disproportionate share patient percentage, its special payment status (e.g., rural referral center, sole community hospital), and its location classification for Medicare payment purposes;
- **DSH File** – for information on the hospital's ratio of Medicare SSI days to Medicare days; and
- **Provider of Services File** – for information on the hospital's name and address (to assist with subsequent merges).

Starting with the Cost Report file, we first selected all short-term general hospitals in our nine study states. We found that 51 of these facilities had multiple records in the Cost Report. Forty of these hospitals had one record representing a full year of data corresponding to FY2002, and a second record with partial-year data from a different FY. For these hospitals we retained the full-year record and deleted the partial-year record. Another six hospitals had a complete year of data for FY2002 reported across two records. In these cases, we combined the two records to form a single full-year record; variables capturing days or dollars were summed across the two records, while percentages were recomputed as weighted averages, using the number of reporting days represented on each record. The final five hospitals with duplicate Cost Report records had incomplete data for FY2002, and were eliminated from the analysis file. We also eliminated another 78 non-duplicate records not representing a full year of data.

We next used the Medicare provider number to add data from the three other CMS files to these base records. In a very small number of cases where Medicare provider numbers had changed for a given facility, this merge was performed manually, using other information about the hospital's name and state.

Rather than rely on the Critical Access Hospital (CAH) flag contained in the Cost Report, we matched the hospitals in our analytic file against a current listing of CAHs obtained from the University of North Carolina Sheps Center and, when a match was found, compared the CAH conversion date from that file with the end of the hospital's fiscal year from the Cost Report. If the conversion occurred prior to the end of the fiscal year, the hospital was flagged as a CAH for the reporting period. This process identified 99 hospitals that were CAHs for all or part of FY2002; these facilities were removed from the analysis file since they are not paid under the prospective payment system and do not receive DSH payments.

We used a SSA-to-FIPS state/county code crosswalk to merge the base analytic file (which uses SSA codes) with the 2002 Area Resource File (which uses FIPS codes) in order to obtain the Urban Influence code of the county in which the hospital is located. This variable was used to classify hospitals according to whether they were located in a metropolitan or non-metropolitan (rural) area, with further distinctions for large metropolitan areas (with a population above 1 million), small metropolitan areas, rural counties adjacent to a metropolitan county, or rural counties not adjacent to a metropolitan county. We also considered the hospital's urban/rural status for Medicare payment purposes as an alternative classification system.

The next step in creating the analytic file was to add information from the audited financial statements obtained from each study state. Variables derived from these files included the hospital's total gross patient revenue from inpatient and outpatient operations, the corresponding gross patient revenue derived from Medicare and from Medicaid, bad debt expenses, and charity care charges (foregone revenue, valued at full charges). Some states created these variables per our specifications and reported only the requested amounts to us. Others provided the entire financial statement, or presented the data in less aggregate form (e.g., reporting inpatient and outpatient revenue separately by payer, or reporting charity care related to Hill-Burton obligations separately from other charity care). In these cases we worked with the raw data to create comparable variables across states. Although some states also reported subsidies associated with local indigent care programs, this information was not available for all states and could not be incorporated into the analysis. With the exception of one state, which supplied the Medicare provider number, all merges relied on the hospital name and, when available in the state file, other information on the hospital's street address, city, county, or zip code. All merges were verified by visual inspection.

Lastly, so that we would be comparing the same hospitals in all instances, we deleted hospitals that were missing any data elements critical to the computation of the DSH payments under either current law or the proposed alternative methods. This step resulted in the deletion of 22 hospitals for which no data was available from the Impact File, another 27 hospitals for which state financial data was either partially or fully missing, and another five hospitals that were missing critical data elements from the Cost Report. The final analysis file contained a total of 954 hospitals. Table 2 shows the distribution of these facilities by state and urban/rural location.

Calculation of Disproportionate Share Payments under Current Law

In order to establish baseline DSH payments against which to compare DSH payments computed under alternative models, we began by using the FY2002 data to simulate the DSH payments the hospitals would have received if the payment rules of the MMA had been in effect at that time. The MMA rules were chosen because they represent the current law regarding DSH payments.

Under the MMA rules, the hospital's disproportionate share patient percentage (DPP) is calculated as:

DPP = (Medicare SSI days / Medicare days) + (Medicaid days / total days).

This amount is captured in the variable DSHPCT that we obtained from the PPS Impact File, and there is no need to re-calculate it directly using Cost Report data. We then computed a new DSH add-on percent using the payment rules shown in Table 1. Hospitals were classified as "urban" or "rural" using the classification variable from the Impact File, which reflects the hospital's location for Medicare payment purposes; in a small number of cases when this variable was missing, we used the hospital's actual urban/rural location (as determined by the Urban Influence code). Size was determined using the Cost Report information on the total number of hospital beds. Sole community and rural referral status were determined using data from the Impact File.

Table 2. Distribution of Study Hospitals by State and Urban/Rural Location

	Total Hospitals	Large Metro. Area	Small Metro. Area	Rural, Adjacent to Metro.	Rural, Not Adjacent to Metro.
California	282 (29%)	197	53	24	8
Connecticut	28 (3%)	10	14	4	0
Florida	131 (14%)	56	54	18	3
Iowa	56 (6%)	0	16	11	29
Texas	239 (25%)	84	57	52	46
Virginia	62 (6%)	23	12	15	12
Washington	56 (6%)	19	17	10	10
West Virginia	34 (4%)	1	12	5	16
Wisconsin	66 (7%)	13	20	22	11
All Study States	954 (100%)	403 (42%)	255 (27%)	161 (17%)	135 (14%)

Finally, we applied each hospital's add-on percent to its total PPS operating payments net of outlier payments, obtained from the Cost Report, to determine the total DSH payment amount. The sum of DSH payments across all hospitals in the study population gave the total amount of Medicare funds being spent on DSH payments in these states under the MMA rules, and served as the budget neutrality constraint in our modeling of alternative proposals.

Calculation of Disproportionate Share Payments under Alternative Proposals

We modeled six alternative proposals. Option 1 was the most straightforward model, and Options 2 through 6 built on this model by incorporating additional constraints or payment rules regarding caps on payments and/or protections for certain categories of hospitals. All models were implemented in a budget neutral manner, such that total DSH payments made under the option were equal to total DSH payments made to study hospitals under the MMA rules.

All alternative models began by using the following formula to compute the hospital's DPP:

DPP = {(Medicare Gross Patient Revenue * Medicare SSI Ratio) +
Medicaid Gross Patient Revenue +
Bad Debt Expenses +
Charity Care Revenue Foregone} / Total Gross Patient Revenue *100

This formulation is consistent with MedPAC's recommendations to incorporate bad debt and charity care into the measure, to express the measure in terms of costs rather than days, and to consider both inpatient and outpatient costs (since the state financial data represent both inpatient and outpatient revenue). The use of gross patient revenue figures (which equal gross charges) is an acceptable proxy for a cost-based measure since the hospital's cost-to-charge ratio must be the same for all types of patients. Contrary to MedPAC's recommendation regarding the DPP measure, we were unable to include the costs of caring for patients covered by other indigent care programs due to the unavailability of consistent data on this population across our study states.

The next step was to examine the distribution of DPP values across all study hospitals in order to identify the threshold values that would permit a given percent of hospitals to qualify for DSH payments. As shown below, we identified thresholds at each decile of the distribution, thereby determining the DPP values that would qualify 10 percent of hospitals, 20 percent of hospitals, and so on, up to a threshold value of zero that permitted all hospitals to receive DSH payments.

Percent of Hospitals Qualifying	DPP Threshold Value
10	47.0
20	34.5
30	27.3
40	23.3
50	20.6
60	17.5
70	14.5
80	11.5
90	8.5
100	0

Thus, for example, since only 10 percent of hospitals had a DPP value above 47.0, this is the threshold value that would permit 10 percent of hospitals to qualify for DSH payments. Additional hospitals qualify as the threshold value falls, until all hospitals qualify when there is no threshold.

We then compared the hospital's DPP value with the relevant threshold value in order to determine the DSH add-on percent that the hospital would receive. In all models, we started with the following formula, which makes the add-on percent directly proportional to the degree to which the hospital's DPP value exceeds the threshold:

$$\text{DSH Add-On Percent} = (\text{DPP} - \text{Threshold}) * \text{PCT}$$

PCT is the conversion factor that preserves budget neutrality given the threshold value being modeled and the distribution of DPP values; this value varies for each model and for each threshold.

Table 3. Overview of Modeling Options

Option	Model Features
Option 1: Basic Model	AOP = (DPP – Threshold) * PCT AOA = AOP * PPS Operating Payments
Option 2: Cap on AOP	Option 1, but AOP is capped at 12 percent Applies only to those hospitals capped under MMA rules
Option 3: Cap on AOA	Option 1, but AOA is capped at 1.75 percent of hospital's total gross patient revenue Applies to all hospitals
Option 4: Basic Model, with Hold Harmless Protections	Option 1, but RRCs and SCHs must receive at least the same amount in DSH payments as they are receiving under the MMA rules
Option 5: Cap on AOP, with Hold Harmless Protections	Option 2, but RRCs and SCHs must receive at least the same amount in DSH payments as they are receiving under the MMA rules
Option 6: Cap on AOA, with Hold Harmless Protections	Option 3, but RRCs and SCHs must receive at least the same amount in DSH payments as they are receiving under the MMA rules

The above add-on percent (AOP) formula contains many of the features MedPAC has recommended in a revised DSH payment system: 1) the same formula applies to all hospitals; 2) the formula does not allow for progressively greater add-on percents at higher DPP levels (as is the case under the current MMA rules); and 3) the formula does not contain a notch effect such that hospitals just barely exceeding the threshold would receive a large add-on percent.

The add-on percent was then applied to the hospital's total PPS operating payments (net of outlier payments) in order to calculate the additional payments made to the hospital in the form of DSH payments (the Add-On Amount, or AOA):

DSH Add-On Amount = Add-On Percent * PPS Operating Payments

Finally, comparison of the hospital's sum of PPS operating and DSH payments made under the MMA rules with the payments made under the alternative model indicates the change in total payments received by the hospital as a result of adopting a new DSH payment method.

The above formulation constitutes the basic model of Option 1. As summarized in Table 3, Options 2 and 3 built upon this basic model by incorporating caps on the DSH payments. In Option 2, we adopted the same 12 percent cap on the DSH add-on percent that is part of current law; this cap applied only to hospitals currently facing the cap. Option 3 experimented with MedPAC's alternative formulation of the cap by limiting the total DSH payments that any hospital may earn to 1.75 percent of its total gross patient revenue. The 1.75 percent figure corresponds to the mean ratio of DSH payments to gross patient revenue under the current payment rules for study hospitals in the top quartile of the distribution of DPP values. These

hospitals were chosen as the basis for computing this cap due to the fact that they provide appreciable amounts of care to low-income and uninsured patients.[2]

Options 4 through 6 replicated the features of Options 1 through 3, respectively, but added a hold harmless feature for rural referral centers (RRCs) and sole community hospitals (SCHs). Under this stipulation, RRCs and SCHs must receive at least as much in DSH payments under the new formulation as they are receiving under the current rules. This protection includes enabling these facilities to receive DSH payments even if their DPP calculated under the new rules does not exceed the requisite qualification threshold.

4.0 RESULTS

Selection of Qualifying Threshold

The first step in analyzing the likely impact of any of the DSH payment options is to determine the threshold value that will be used to determine qualification and compute the add-on percent. Ultimately, this choice is a policy decision, driven by considerations about the number and types of hospitals one would like to see receiving DSH payments (which is independent of the payment option being considered) and by the way DSH payments would be distributed across qualifying hospitals (which could vary according to the option being modeled).

Impact of the Threshold on the Types of Hospitals Qualifying. In Table 4, we show the variation in the probability that hospitals with a particular characteristic would qualify for DSH payments under each of the thresholds, and compare this with the situation under the MMA rules. For example, under the MMA rules, 68 percent of the hospitals in our study population would qualify for DSH payments (have a DPP above the MMA threshold of 15 percent), and the likelihood of qualifying is about the same for hospitals located in metropolitan areas (69 percent) as for hospitals in rural areas (66 percent). The qualifying probability increases with hospital bedsize, however, and is appreciably higher for public teaching hospitals, urban public hospitals, SCHs and large rural hospitals, and hospitals currently in the most precarious financial position (earning the lowest margins).

In contrast, under the alternative DPP formulation that incorporates uncompensated care, a threshold that would qualify a similar percent of hospitals (i.e., the 70-percent threshold) results in relatively more rural hospitals qualifying than urban hospitals (73 percent vs. 69 percent). This relative advantage for rural hospitals is present at all but the most restrictive thresholds (i.e., those limiting receipt of DSH payments to no more than 30 percent of hospitals). It is also true that regardless of the threshold chosen, relatively more of the lowest-margin hospitals would continue to receive DSH payments, as would public teaching and urban public hospitals. At the extremely restrictive thresholds, however, the qualification advantage currently enjoyed by SCHs and larger rural hospitals disappears.

Financial Implications of the Threshold Choice. The financial implications associated with each threshold will depend on the payment option under consideration. In Figures 1 through 6

[2] To put this percent into context, similar figures were 0.89 for all public teaching hospitals, 0.77 for all urban hospitals, 0.64 for all rural hospitals, 1.13 for all RRCs, and 2.27 for hospitals in the top decile of DPP values.

Table 4. Characteristics of Hospitals Qualifying at Different Thresholds and Under MMA Rules

Type of Hospital	Number of Hospitals	Percent of Hospitals with Given Characteristic that Qualify for DSH Payments									
		90% Threshold	80% Threshold	70% Threshold	60% Threshold	50% Threshold	40% Threshold	30% Threshold	20% Threshold	10% Threshold	MMA Rules
All hospitals	954	90	80	70	60	50	40	30	20	10	68
Urban payment classification	664	89	78	68	58	48	39	30	23	13	69
Rural payment classification	290	92	84	74	66	54	43	30	14	4	67
Metropolitan area	658	89	79	69	58	48	39	31	23	13	69
Nonmetropolitan (rural) area	296	92	83	73	65	53	42	28	14	4	66
Large metropolitan area	403	90	80	69	60	52	43	35	27	16	71
Small metropolitan area	255	89	77	67	55	43	33	23	17	7	66
Rural, adjacent to metro area	161	94	83	73	63	52	42	29	15	3	62
Rural, not adjacent to metro area	135	90	82	73	67	54	42	28	13	4	70
Urban, 1-99 beds	128	83	66	55	47	38	29	23	17	11	48
Urban, 100+ beds	520	91	81	71	60	50	40	31	23	13	74
Rural referral center	35	97	86	66	54	40	31	17	11	3	63
Sole community hospital	116	97	93	87	80	69	54	39	23	8	79
RRC and SCH	8	100	88	50	38	38	13	0	0	0	50
Other rural, 1-99 beds	138	86	75	65	56	46	39	30	12	3	58
Other rural, 100+ beds	9	100	100	100	100	78	78	33	11	0	78
Voluntary, non-profit	505	90	76	64	53	41	30	21	12	5	62
Proprietary	254	89	82	73	64	54	46	36	26	15	73
Government owned (public)	195	92	88	81	74	66	58	46	32	16	77
Urban, public	84	99	96	89	81	76	69	60	48	31	88
Rural, public	111	87	82	75	68	59	50	36	20	5	69
1-25 beds	41	80	73	73	68	59	46	39	32	17	59
26-50 beds	194	88	77	70	61	51	41	32	16	6	60
51-100 beds	152	91	78	64	55	47	38	26	15	7	63
101-200 beds	282	92	82	71	61	51	44	32	23	12	71
200+ beds	285	91	83	72	59	48	36	27	21	11	75
Private teaching hospital	224	90	81	72	60	50	37	27	20	8	74
Public teaching hospital	41	100	100	100	93	88	80	73	66	54	100
Non-teaching hospital	689	90	79	67	58	47	39	28	17	8	64
Top quartile, total margin	237	88	75	62	53	43	32	26	17	8	62
3rd quartile, total margin	236	88	75	62	50	40	30	22	14	8	66
2nd quartile, total margin	236	89	80	71	59	49	40	28	19	8	65
Bottom quartile, total margin	245	96	90	84	78	67	58	43	30	15	79

Figure 1. Change in PPS Payments for Low- and High-Margin Hospitals, Option 1

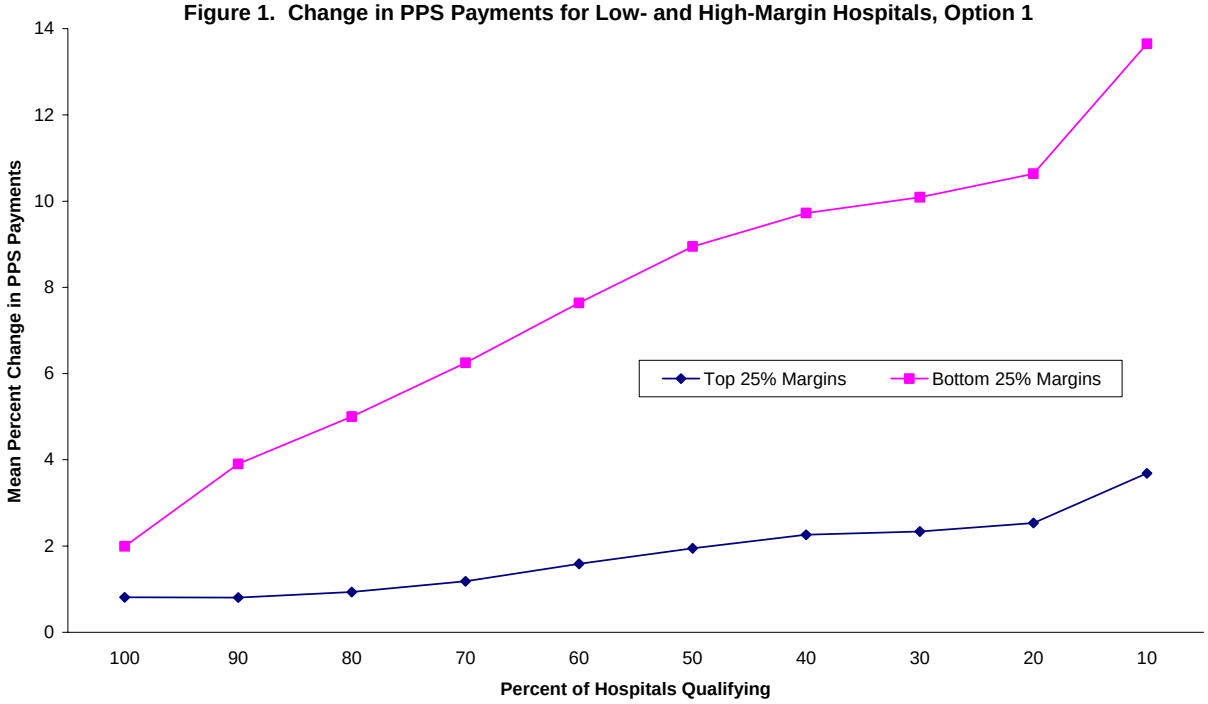
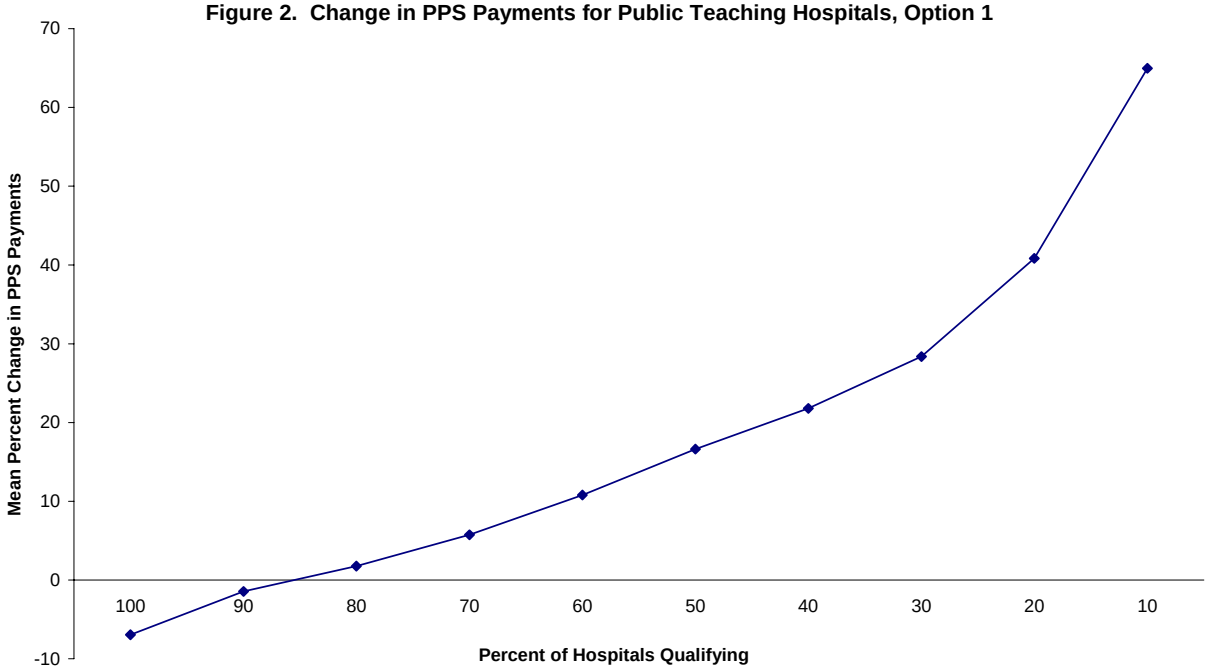


Figure 2. Change in PPS Payments for Public Teaching Hospitals, Option 1

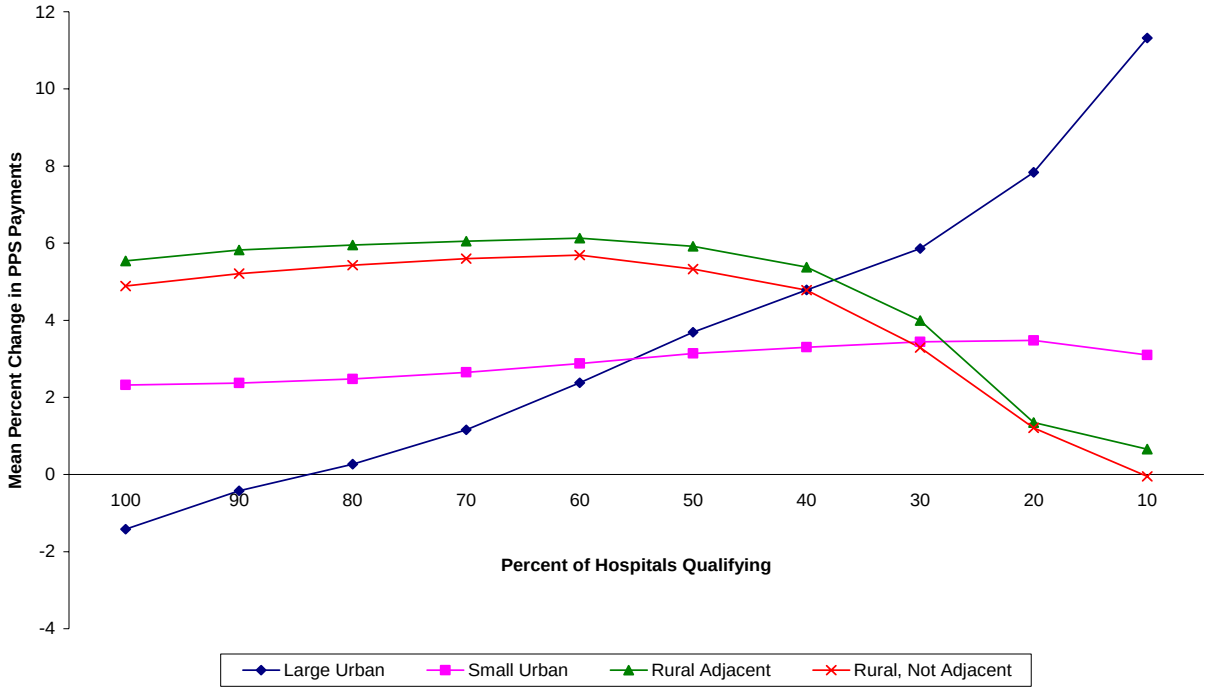


we show how DSH payments would be affected under Option 1 for various types of hospitals for the full range of possible qualifying thresholds. Figure 1, for example, indicates that if the threshold is set so that only 10 percent of all hospitals receive DSH payments, hospitals initially in the lowest quartile of the total margin distribution would expect, on average, to see their PPS payments increase by 13.6 percent if the DSH payment rules of Option 1 were adopted, while hospitals with the highest total margins would expect an average payment increase of 3.7 percent. As the threshold is lowered so that more and more hospitals qualify (moving to the left on the X axis), these gains are necessarily spread across a larger number of hospitals and the average increase for each hospital falls. Regardless of where the threshold is set, however, Option 1 would help low-margin hospitals more than it would help high-margin hospitals.

Figure 2 presents similar information for the public teaching hospitals normally considered to be the backbone of the safety net system. These hospitals would receive huge average increases in PPS payments under Option 1 if the DSH payments are restricted to only 10 percent of hospitals, but would experience net losses under a very inclusive DSH payment policy.

Figure 3 shows that Option 1 would be more beneficial to rural hospitals than urban hospitals as long as the threshold is set so that at least 40 percent of hospitals receive DSH payments. At more restrictive thresholds, urban facilities – particularly those located in metropolitan areas with a population above 1 million – would experience larger average gains in their PPS payments under Option 1.

Figure 3. Change in PPS Payments by Hospital Location, Option 1



In addition to considering the size of the average payment change at different thresholds, we examined the proportion of hospitals that would be 'big winners' or 'big losers', defined as experiencing a payment increase or decrease of more than 10 percent. Figure 4 displays the distribution of big winners and big losers by threshold, for all hospitals considered as a group. We see that a 50-percent qualifying threshold yields the largest percent of winners relative to losers (19.7 percent of hospitals would experience large gains compared with only 4.9 percent experiencing large losses). Smaller relative gains are observed for most of the other thresholds, but at either extreme more hospitals would experience large losses than would receive large payment increases.

Figure 4. Big Winners and Losers under Option 1, by Qualifying Threshold, All Hospitals

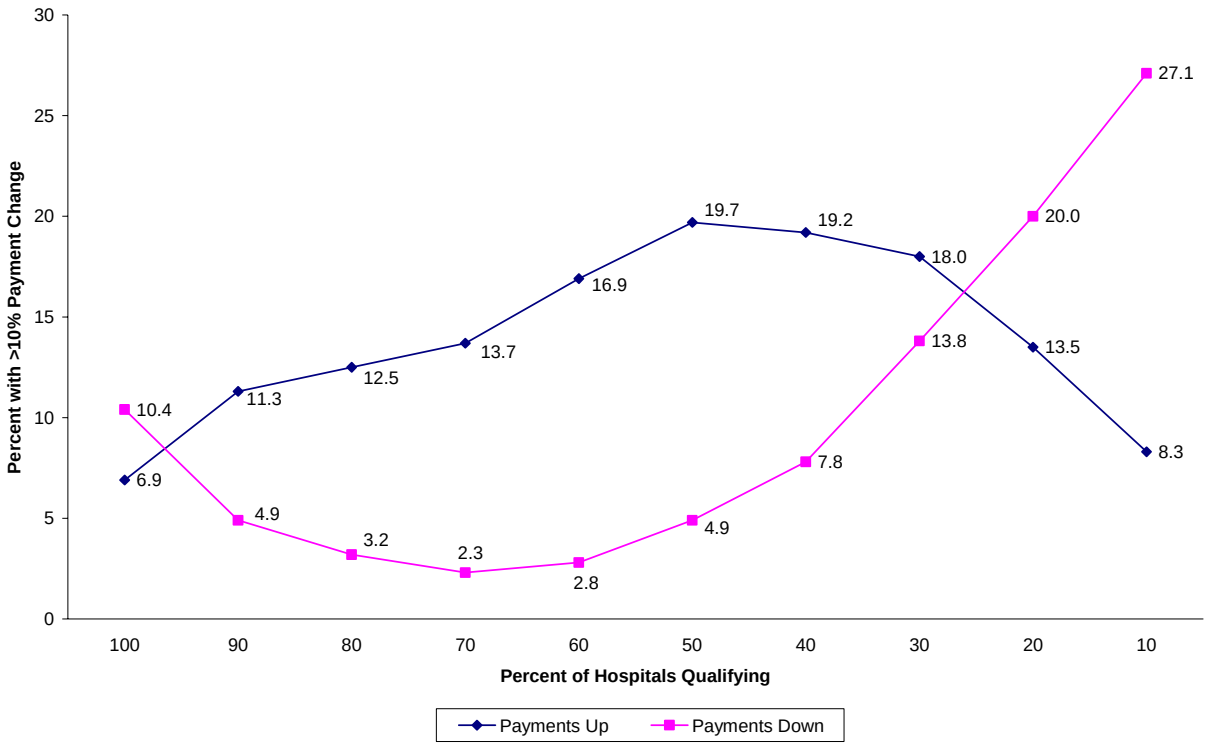


Figure 5 examines differences in the proportion of large winners and losers according to the location of the hospital. These graphs show that the number of winners would outpace the number of losers at all but the extreme thresholds, but that the threshold that maximizes the winners relative to losers varies by hospital location. In most cases, the maximum difference is achieved at thresholds of 50 to 70 percent. Likewise, Figure 6 shows that a 50-percent threshold would maximize the winners relative to losers among public teaching hospitals.

Based on these types of analyses, we suggest that a threshold that would permit 40 to 70 percent of hospitals to receive DSH payments would be recommended. Restricting DSH payments to less than 40 percent of hospitals would result in very large gains for public teaching hospitals, provide larger gains to urban hospitals than to rural hospitals, and raise the proportion of large losers at the expense of large winners. Conversely, permitting more than 70 percent of hospitals

Figure 5. Big Winners and Losers under Option 1, by Qualifying Threshold and Hospital Location

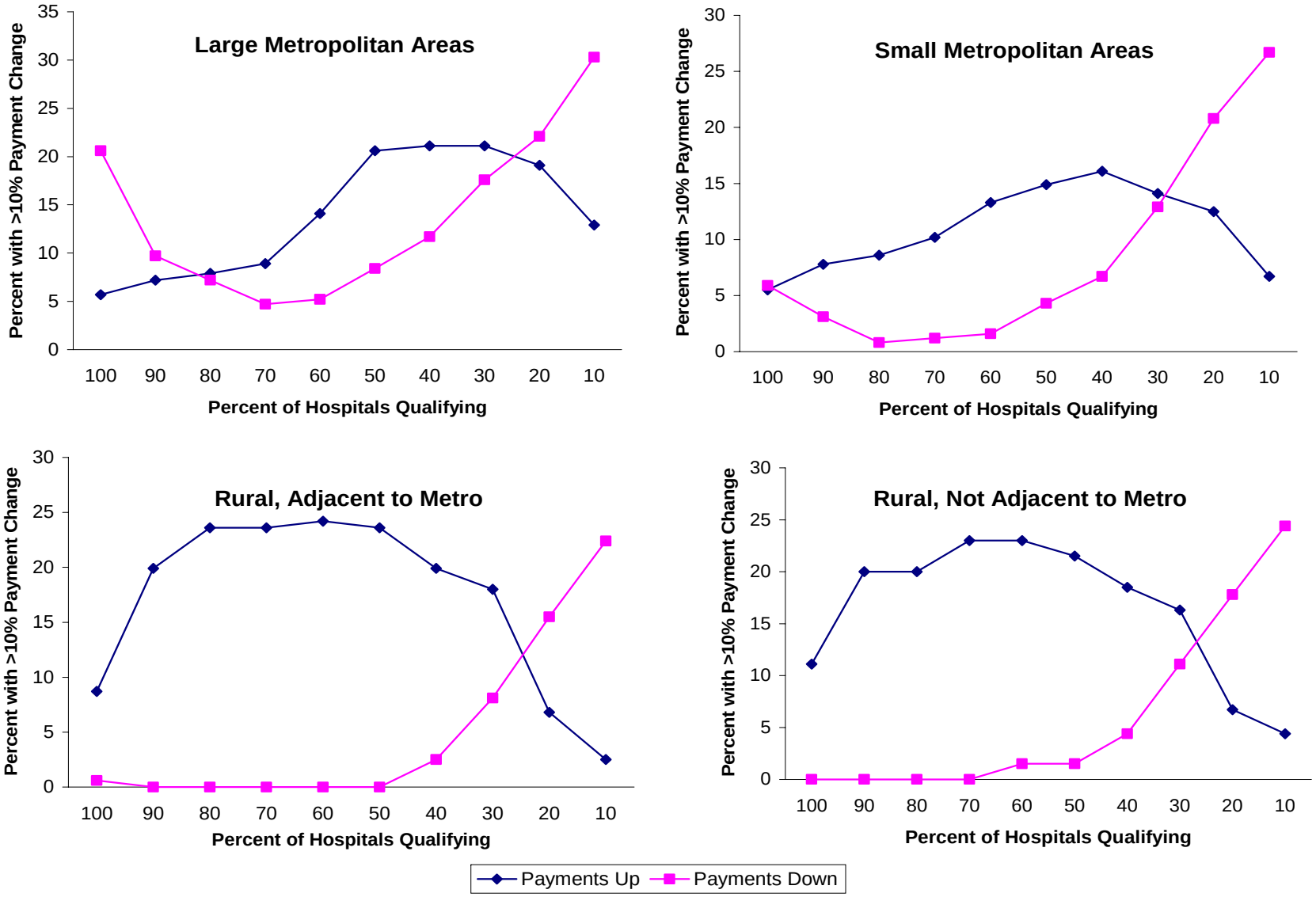
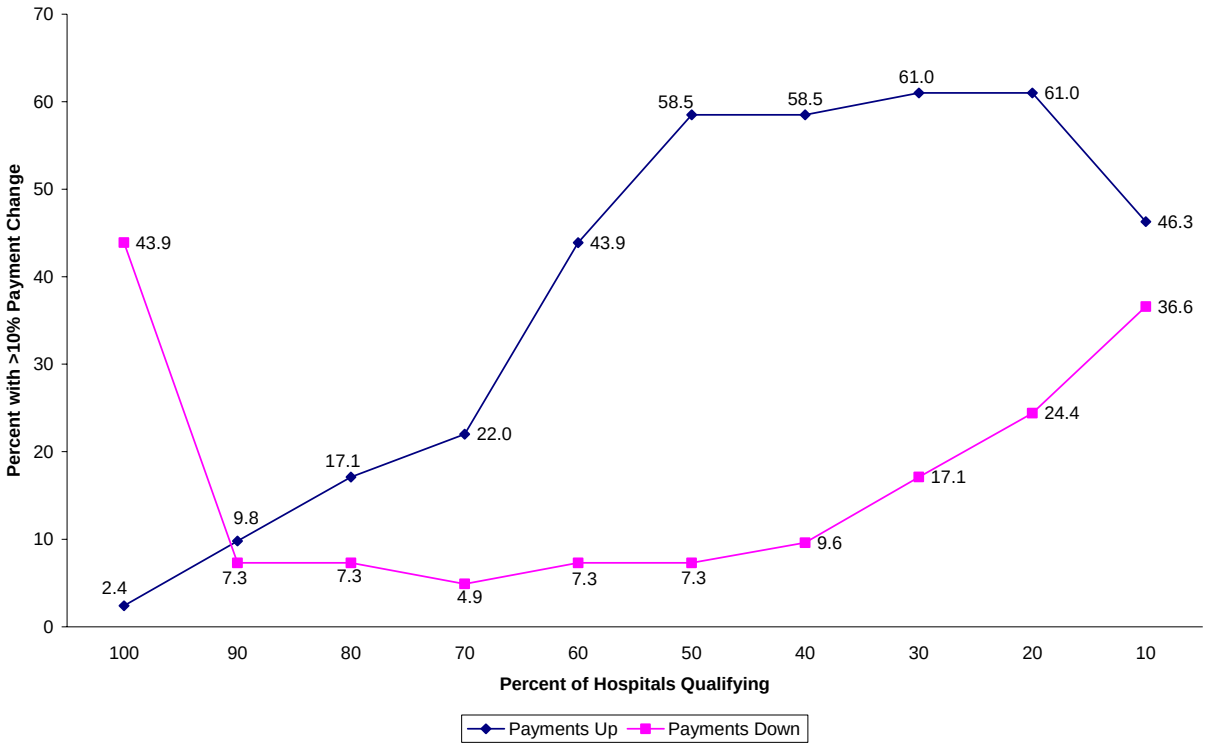


Figure 6. Big Winners and Losers under Option 1, Public Teaching Hospitals



to qualify would disadvantage public teaching hospitals and hospitals in large metropolitan areas while not providing additional help to rural hospitals and would, again, tend to reduce the number of large winners relative to large losers.

Appendix A contains similar sets of figures for Options 2 through 6. As a rule, this evidence also argues for thresholds in the 40 and 70 percent range, and a convincing case could be made for further narrowing the range so that 50 to 60 percent of hospitals qualify. This range is completely consistent with MedPAC's earlier recommendations regarding the qualifying threshold.

Mean Change in PPS Payments under the Alternative Payment Options

Base Model (Option 1). Table 5 shows the mean change in PPS base payments plus DSH adjustments under Option 1 relative to the MMA payment rules, for the 40 to 70 percent range of thresholds most likely to be viable policy options. On average, hospitals would expect Option 1's formulation of the DSH payment system to increase their PPS payments by anywhere from 3.0 to 4.5 percent, depending on the qualification threshold chosen, and gains by rural hospitals would outpace gains by urban hospitals throughout this range. The largest gains are consistently experienced by hospitals with the fewest beds and the lowest margins, and by public hospitals – particularly those located in an urban area and those with a teaching mission. When examined according to hospital characteristics that play a role in the calculation of the DSH add-on percent under the MMA formulation, we see that small urban hospitals, SCHs, and rural hospitals of all

Table 5. Mean Change in PPS Payments Under Option 1, by Qualifying Threshold and by Type of Hospital

Type of Hospital	Number of Hospitals	Percent of Hospitals Qualifying			
		40 Percent	50 Percent	60 Percent	70 Percent
All hospitals	954	4.5	4.1	3.6	3.0
Urban payment classification (%)	664	4.0	3.3	2.4	1.6
Rural payment classification	290	5.7	6.2	6.4	6.2
Metropolitan area	658	4.2	3.5	2.6	1.7
Nonmetropolitan (rural) area	296	5.1	5.7	5.9	5.8
Large metropolitan area	403	4.8	3.7	2.4	1.2
Small metropolitan area	255	3.3	3.1	2.9	2.6
Rural, adjacent to metro area	161	5.4	5.9	6.1	6.0
Rural, not adjacent to metro area	135	4.8	5.3	5.7	5.6
Urban, 1-99 beds	128	10.4	9.4	8.5	7.6
Urban, 100+ beds	520	2.0	1.4	0.6	-0.1
Rural referral center	35	0.8	1.2	1.5	1.7
Sole community hospital	116	10.1	10.2	9.9	9.2
RRC and SCH	8	-1.8	-0.6	0.7	1.3
Other rural, 1-99 beds	138	5.0	5.5	5.6	5.5
Other rural, 100+ beds	9	5.0	6.8	8.1	8.1
Voluntary, non-profit	505	1.1	1.3	1.5	1.6
Proprietary	254	5.5	4.6	3.4	2.3
Government owned (public)	195	12.0	10.9	9.3	7.5
Urban, public	84	16.4	13.7	10.2	7.0
Rural, public	111	8.6	8.8	8.6	7.9
1-25 beds	41	20.0	17.9	15.6	13.4
26-50 beds	194	7.6	7.7	7.6	7.2
51-100 beds	152	6.2	6.2	5.9	5.4
101-200 beds	282	3.0	2.5	1.7	0.9
200+ beds	285	0.8	0.4	-0.1	-0.5
Private teaching hospital	224	0.4	0.3	0.1	-0.1
Public teaching hospital	41	21.8	16.6	10.8	5.7
Non-teaching hospital	689	4.8	4.7	4.3	3.9
Top quartile, total margin	237	2.2	1.9	1.5	1.1
3rd quartile, total margin	236	1.6	1.5	1.4	1.2
2nd quartile, total margin	236	4.3	4.1	3.8	3.3
Bottom quartile, total margin	245	9.7	8.9	7.6	6.2

sizes[3] would expect the largest increase in PPS payments if Option 1 were implemented. These gains are due to the fact that these categories of hospitals face a cap on add-on percents under the current rules, which is no longer present in Option 1.

Impact of the Cap on DSH Add-On Percents (Option 2). As shown in Table 6, the re-introduction of the 12 percent cap (in Option 2) erases the gains made by these categories of hospitals, and generally lowers the average gains for nearly all types of hospitals. Most notably, at the more restrictive end of the threshold range, the average rural hospital would expect Option 2 to lower its PPS payments, while payments would be higher for the average urban hospital. Similarly, when DSH eligibility is limited to only 40 or 50 percent of hospitals, the average facility with fewer than 100 beds would see a decline in its PPS payments due to the caps of Option 2, rather than the very large payment increase it would have garnered under Option 1. It is only as the threshold is relaxed and additional small and rural hospitals qualify for DSH payments that Option 2 would begin to provide a modest boost in PPS income for these hospitals. Even with the caps, however, Option 2 continues to provide the largest payment increases to the hospitals in the worst financial position, and urban public hospitals would continue to expect sizeable payment increases (albeit not as large as under Option 1 since urban hospitals with fewer than 100 beds do face the cap under Option 2). And, since so few public teaching hospitals are subject to the 12 percent cap, implementing Option 2 in a budget neutral manner provides these hospitals with even larger payment increases than the already significant gains received under Option 1.

Impact of the Cap on DSH Payments (Option 3). Table 7 explores the implications of capping a hospital's total DSH payments at no more than 1.75 percent of its total gross patient revenue; in contrast to Option 2, this cap applies to all hospitals.[4] Compared to the Option 1 results shown in Table 5 where no cap is imposed, Option 3's cap has the effect of lowering average gains for most, but not all, types of hospitals. Overall, rural hospitals would do somewhat better under Option 3 than urban counterparts, and rural hospitals located in counties adjacent to a metropolitan area would do somewhat better than counterparts in more remote rural counties. However, among hospitals with fewer than 100 beds, larger gains could be expected for urban facilities than for rural ones. Rural hospitals with a SCH designation would fare relatively well under Option 3, while a RRC designation would not impart similar advantages. Public hospitals, in general, and urban public hospitals, in particular, would see large payment gains under Option 3, as would public teaching hospitals. Gains would also be largest for the smallest hospitals and for those with the lowest margins.

For greater simplicity in comparing the payment implications of the first three options, Figure 7 displays the mean percent change in PPS payments under each option relative to current law for various categories of hospitals; a 50 percent qualifying threshold is used, purely for illustrative purposes. In panel A, we see that Option 1 is of most benefit to small urban hospitals, SCHs,

[3] While the DSH add-on percent calculations differentiate between other rural hospitals with fewer than 500 beds (which face a 12% cap) and those with more than 500 beds, our 9-state sample did not contain any rural hospitals with more than 500 beds.

[4] It was not mathematically possible to limit DSH qualification to less than 50 percent of the study hospitals, cap the total DSH payments that could be earned by a hospital, and have total DSH payments for qualifying hospitals sum to the budget neutrality amount. Thus, neither Option 3 nor Option 6 has results for any threshold below the 50 percent mark.

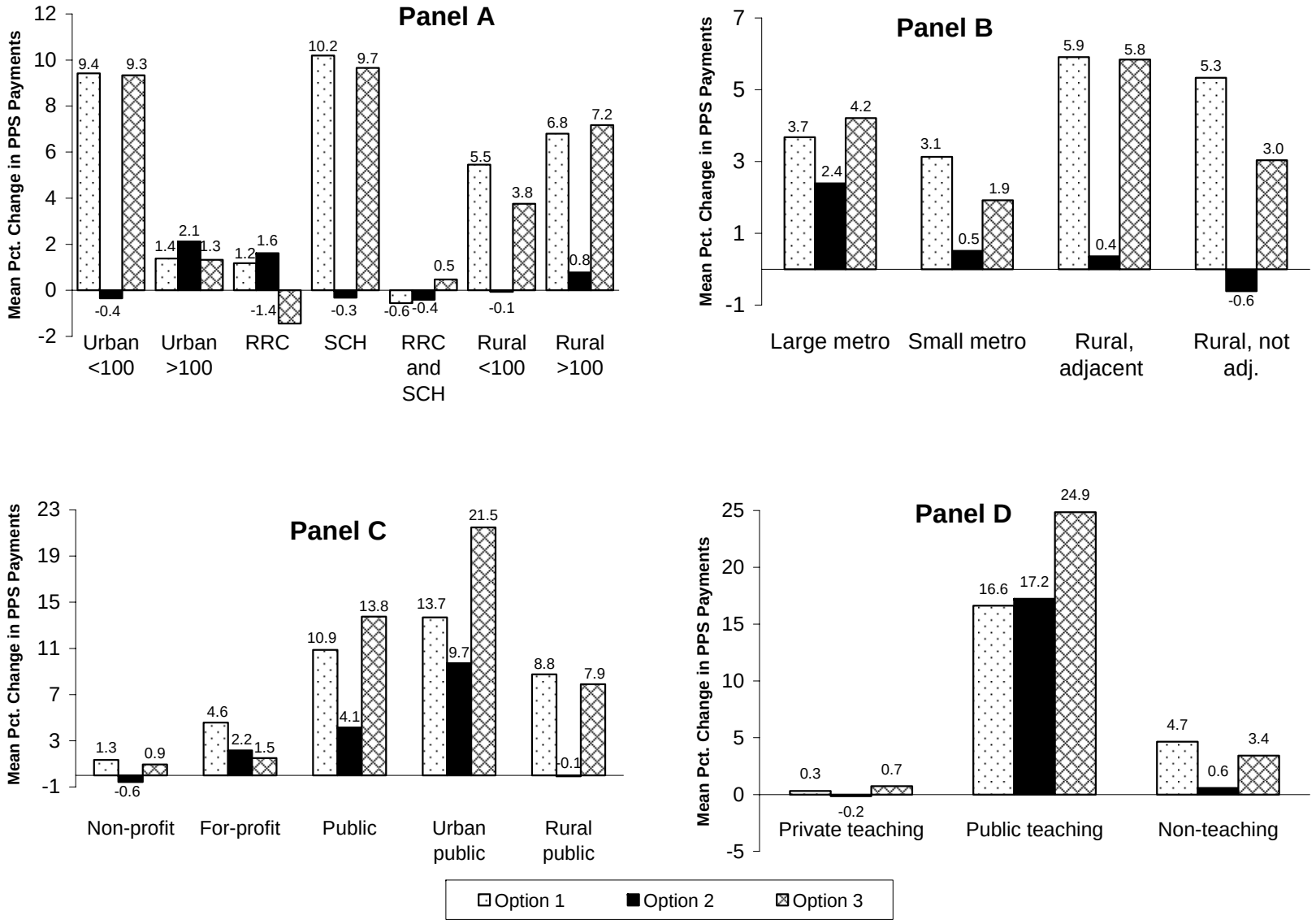
Table 6. Mean Change in PPS Payments Under Option 2, by Qualifying Threshold and by Type of Hospital

Type of Hospital	Number of Hospitals	Percent of Hospitals Qualifying			
		40 Percent	50 Percent	60 Percent	70 Percent
All hospitals	954	1.2	1.1	1.0	0.8
Urban payment classification (%)	664	2.1	1.6	1.1	0.5
Rural payment classification	290	-0.9	-0.1	0.8	1.6
Metropolitan area	658	2.1	1.7	1.1	0.5
Nonmetropolitan (rural) area	296	-0.9	-0.1	0.8	1.5
Large metropolitan area	403	3.3	2.4	1.3	0.3
Small metropolitan area	255	0.3	0.5	0.7	0.9
Rural, adjacent to metro area	161	-0.4	0.4	1.1	1.8
Rural, not adjacent to metro area	135	-1.5	-0.6	0.4	1.2
Urban, 1-99 beds	128	-0.8	-0.4	0.5	1.1
Urban, 100+ beds	520	2.8	2.1	1.2	0.4
Rural referral center	35	1.3	1.6	1.9	2.1
Sole community hospital	116	-1.3	-0.3	0.8	1.7
RRC and SCH	8	-1.8	-0.4	0.9	1.4
Other rural, 1-99 beds	138	-0.7	-0.1	0.6	1.3
Other rural, 100+ beds	9	-0.3	0.8	1.8	2.4
Voluntary, non-profit	505	-1.0	-0.6	-0.1	0.3
Proprietary	254	2.9	2.2	1.3	0.6
Government owned (public)	195	4.7	4.1	3.5	2.7
Urban, public	84	12.0	9.7	6.8	4.2
Rural, public	111	-0.9	-0.1	0.9	1.6
1-25 beds	41	-0.2	0.2	1.2	1.9
26-50 beds	194	-0.7	-0.1	0.9	1.6
51-100 beds	152	-0.8	-0.4	0.2	0.7
101-200 beds	282	3.5	3.0	2.1	1.2
200+ beds	285	1.5	1.0	0.4	-0.1
Private teaching hospital	224	-0.2	-0.2	-0.3	-0.4
Public teaching hospital	41	22.6	17.2	11.2	5.9
Non-teaching hospital	689	0.4	0.6	0.8	1.0
Top quartile, total margin	237	0.0	-0.1	-0.1	-0.2
3rd quartile, total margin	236	-1.0	-0.9	-0.6	-0.4
2nd quartile, total margin	236	1.8	1.8	1.7	1.6
Bottom quartile, total margin	245	3.8	3.5	3.0	2.4

Table 7. Mean Change in PPS Payments Under Option 3, by Qualifying Threshold and by Type of Hospital

Type of Hospital	Number of Hospitals	Percent of Hospitals Qualifying		
		50 Percent	60 Percent	70 Percent
All hospitals	954	3.7	2.9	2.4
Urban payment classification (%)	664	3.1	2.0	1.3
Rural payment classification	290	5.0	4.9	4.9
Metropolitan area	658	3.3	2.2	1.4
Nonmetropolitan (rural) area	296	4.6	4.5	4.6
Large metropolitan area	403	4.2	2.1	0.8
Small metropolitan area	255	1.9	2.3	2.4
Rural, adjacent to metro area	161	5.8	5.1	5.1
Rural, not adjacent to metro area	135	3.0	3.8	3.9
Urban, 1-99 beds	128	9.3	7.5	6.5
Urban, 100+ beds	520	1.3	0.4	-0.3
Rural referral center	35	-1.4	-0.6	0.2
Sole community hospital	116	9.7	8.8	8.0
RRC and SCH	8	0.5	1.1	1.3
Other rural, 1-99 beds	138	3.8	3.8	4.1
Other rural, 100+ beds	9	7.2	8.6	8.3
Voluntary, non-profit	505	0.9	1.2	1.4
Proprietary	254	1.5	1.2	0.7
Government owned (public)	195	13.8	9.4	7.3
Urban, public	84	21.5	12.6	8.3
Rural, public	111	7.9	7.1	6.5
1-25 beds	41	28.9	18.4	14.1
26-50 beds	194	5.9	6.0	5.8
51-100 beds	152	3.0	3.5	3.7
101-200 beds	282	0.6	0.3	-0.1
200+ beds	285	2.0	0.8	0.1
Private teaching hospital	224	0.7	0.4	-0.1
Public teaching hospital	41	24.9	14.3	8.3
Non-teaching hospital	689	3.4	3.1	2.9
Top quartile, total margin	237	4.7	2.6	1.6
3rd quartile, total margin	236	-0.4	-0.2	0.0
2nd quartile, total margin	236	3.6	3.4	3.0
Bottom quartile, total margin	245	6.8	5.8	4.9

Figure 7. Comparison of Financial Impact of Options 1, 2, and 3 for Selected Categories of Hospitals



and other rural hospitals without a special payment designation since the current-law cap on DSH add-on percents faced by these facilities is not present in Option 1. Re-instituting the cap via Option 2 removes all gains by these categories of hospitals, to the benefit of RRCs and larger urban hospitals. Use of the alternative cap of Option 3 produces financial impacts that are more similar to the results obtained under Option 1, with the exception of small rural hospitals – which do not fare as well under Option 3, and RRCs – which would see their average payment fall below current levels. Panel B of Figure 7 shows that Option 1 would be more favorable to rural hospitals than to urban hospitals, while Option 3 is less beneficial than Option 1 for hospitals in remote rural counties as well as for those in small urban areas. Option 2 would reduce the average payment increase (relative to Option 1) for hospitals in all locations, and even result in a decline in payments relative to current law for remote rural hospitals. Public hospitals, especially those in urban areas and those with a teaching mission, receive the largest payment increases relative to current law regardless of the option being considered (Panels C and D). When compared with the gains under Option 1, the caps of Option 2 are severely detrimental to rural public hospitals and non-teaching hospitals.

Impact of the Hold Harmless Provision (Options 4 through 6). The remaining three options replicate all features of the first three options, but add a hold harmless provision for RRCs and SCHs. Results for these models are shown in Tables 8-10, which are directly comparable to Tables 5-7, respectively. As expected, RRCs and SCHs have either made larger gains under these last three options or have had their losses under the first three options reversed. Due to the budget neutrality constraint, these gains have come at the expense of other types of hospitals, including rural hospitals without these special payment classifications. However, since RRCs and SCHs represent less than 17 percent of our study population, the impact of holding these facilities harmless has not had a significant impact on the general pattern of results noted earlier for Options 1 through 3.

Figures 8-11 display the impact of the hold harmless provision for various groups of hospitals, again using the results for the 50 percent threshold for illustrative purposes. Figure 8, for example, shows clearly the degree to which the hold harmless provision helped RRCs and SCHs when it was added to Options 1 through 3, and shows the hospitals from which DSH payments were taken in order to finance the hold harmless payments so that budget neutrality could be maintained. As noted above, these average reductions are generally quite small, due to the number of RRCs and SCHs relative to all other hospitals. Figure 9 shows how the hold harmless provision increased payments to rural hospitals, while slightly decreasing payments to urban facilities. In Figure 10, we see that the modest gains made by rural public hospitals thanks to the hold harmless provision came at the expense of smaller payment gains for urban public hospitals. Finally, in Figure 11, we see that the hold harmless provision has resulted in a reallocation of payments away from public teaching hospitals to the very modest benefit of non-teaching hospitals.

Characteristics of Hospitals that are Large Winners or Large Losers

In addition to considering the average percent change in PPS payments, which blends the experiences of all hospitals into a single number and may mask the extremes, it is important to

Table 8. Mean Change in PPS Payments Under Option 4, by Qualifying Threshold and by Type of Hospital

Type of Hospital	Number of Hospitals	Percent of Hospitals Qualifying			
		40 Percent	50 Percent	60 Percent	70 Percent
All hospitals	954	4.6	4.2	3.7	3.1
Urban payment classification (%)	664	3.7	3.1	2.3	1.6
Rural payment classification	290	6.7	6.8	6.8	6.4
Metropolitan area	658	4.0	3.3	2.5	1.7
Nonmetropolitan (rural) area	296	6.1	6.3	6.3	6.0
Large metropolitan area	403	4.5	3.5	2.3	1.1
Small metropolitan area	255	3.1	3.0	2.8	2.6
Rural, adjacent to metro area	161	6.0	6.3	6.4	6.2
Rural, not adjacent to metro area	135	6.1	6.2	6.2	5.9
Urban, 1-99 beds	128	10.1	9.3	8.4	7.5
Urban, 100+ beds	520	1.7	1.2	0.5	-0.2
Rural referral center	35	3.1	3.0	2.8	2.5
Sole community hospital	116	12.0	11.4	10.6	9.6
RRC and SCH	8	0.4	0.8	1.5	1.7
Other rural, 1-99 beds	138	4.8	5.3	5.5	5.5
Other rural, 100+ beds	9	4.8	6.6	8.0	8.0
Voluntary, non-profit	505	1.3	1.5	1.6	1.7
Proprietary	254	5.6	4.6	3.4	2.3
Government owned (public)	195	12.0	10.9	9.3	7.6
Urban, public	84	15.9	13.3	10.0	6.9
Rural, public	111	9.1	9.1	8.7	8.1
1-25 beds	41	20.2	17.9	15.6	13.5
26-50 beds	194	7.9	7.9	7.7	7.2
51-100 beds	152	6.8	6.5	6.1	5.6
101-200 beds	282	3.0	2.5	1.8	0.9
200+ beds	285	0.6	0.2	-0.2	-0.6
Private teaching hospital	224	0.4	0.3	0.1	-0.2
Public teaching hospital	41	21.0	16.1	10.5	5.6
Non-teaching hospital	689	5.0	4.8	4.4	3.9
Top quartile, total margin	237	2.4	2.0	1.6	1.2
3rd quartile, total margin	236	1.8	1.6	1.5	1.3
2nd quartile, total margin	236	4.4	4.3	3.9	3.4
Bottom quartile, total margin	245	9.7	8.9	7.6	6.2

Table 9. Mean Change in PPS Payments Under Option 5, by Qualifying Threshold and by Type of Hospital

Type of Hospital	Number of Hospitals	Percent of Hospitals Qualifying			
		40 Percent	50 Percent	60 Percent	70 Percent
All hospitals	954	1.4	1.3	1.1	0.9
Urban payment classification (%)	664	1.9	1.5	1.0	0.5
Rural payment classification	290	0.3	0.7	1.3	1.8
Metropolitan area	658	1.9	1.5	1.0	0.5
Nonmetropolitan (rural) area	296	0.2	0.6	1.2	1.8
Large metropolitan area	403	3.0	2.2	1.2	0.3
Small metropolitan area	255	0.2	0.4	0.7	0.9
Rural, adjacent to metro area	161	0.4	0.9	1.4	2.0
Rural, not adjacent to metro area	135	0.0	0.4	1.0	1.5
Urban, 1-99 beds	128	-0.8	-0.4	0.5	1.1
Urban, 100+ beds	520	2.5	1.9	1.1	0.3
Rural referral center	35	3.5	3.3	3.1	2.8
Sole community hospital	116	0.7	1.0	1.6	2.1
RRC and SCH	8	0.4	0.9	1.6	1.9
Other rural, 1-99 beds	138	-0.7	-0.1	0.6	1.3
Other rural, 100+ beds	9	-0.4	0.8	1.8	2.4
Voluntary, non-profit	505	-0.7	-0.4	0.0	0.3
Proprietary	254	3.0	2.2	1.4	0.6
Government owned (public)	195	4.9	4.3	3.5	2.8
Urban, public	84	11.6	9.4	6.7	4.1
Rural, public	111	-0.2	0.4	1.2	1.8
1-25 beds	41	0.3	0.6	1.4	2.0
26-50 beds	194	-0.2	0.3	1.1	1.7
51-100 beds	152	-0.1	0.1	0.5	0.9
101-200 beds	282	3.6	3.0	2.1	1.2
200+ beds	285	1.3	0.9	0.4	-0.1
Private teaching hospital	224	-0.2	-0.2	-0.3	-0.5
Public teaching hospital	41	21.8	16.7	10.9	5.8
Non-teaching hospital	689	0.7	0.8	1.0	1.1
Top quartile, total margin	237	0.2	0.1	0.0	-0.1
3rd quartile, total margin	236	-0.7	-0.6	-0.5	-0.3
2nd quartile, total margin	236	2.1	2.0	1.8	1.7
Bottom quartile, total margin	245	3.9	3.5	2.9	2.3

Table 10. Mean Change in PPS Payments Under Option 6, by Qualifying Threshold and by Type of Hospital

Type of Hospital	Number of Hospitals	Percent of Hospitals Qualifying		
		50 Percent	60 Percent	70 Percent
All hospitals	954	3.8	3.0	2.4
Urban payment classification (%)	664	3.0	2.0	1.3
Rural payment classification	290	5.6	5.2	5.1
Metropolitan area	658	3.2	2.1	1.4
Nonmetropolitan (rural) area	296	5.1	4.8	4.8
Large metropolitan area	403	4.0	2.0	0.7
Small metropolitan area	255	1.9	2.3	2.4
Rural, adjacent to metro area	161	6.2	5.4	5.3
Rural, not adjacent to metro area	135	3.8	4.1	4.2
Urban, 1-99 beds	128	9.1	7.4	6.5
Urban, 100+ beds	520	1.2	0.3	-0.3
Rural referral center	35	1.2	1.4	1.7
Sole community hospital	116	10.5	9.2	8.4
RRC and SCH	8	1.4	1.4	1.5
Other rural, 1-99 beds	138	3.7	3.8	4.1
Other rural, 100+ beds	9	7.2	8.5	8.3
Voluntary, non-profit	505	1.1	1.3	1.4
Proprietary	254	1.6	1.3	1.4
Government owned (public)	195	13.6	9.5	7.3
Urban, public	84	20.7	12.4	8.2
Rural, public	111	8.2	7.2	6.7
1-25 beds	41	28.1	18.2	14.1
26-50 beds	194	6.1	6.1	5.9
51-100 beds	152	3.3	3.7	3.8
101-200 beds	282	0.9	0.5	0.1
200+ beds	285	1.9	0.7	0.0
Private teaching hospital	224	0.7	0.3	-0.1
Public teaching hospital	41	24.0	14.1	8.1
Non-teaching hospital	689	3.6	3.2	3.0
Top quartile, total margin	237	4.7	2.6	1.6
3rd quartile, total margin	236	-0.3	-0.1	0.1
2nd quartile, total margin	236	3.9	3.6	3.2
Bottom quartile, total margin	245	6.8	5.7	4.8

Figure 8. Comparison of Impact of Hold Harmless Provision, by DSH Payment Group

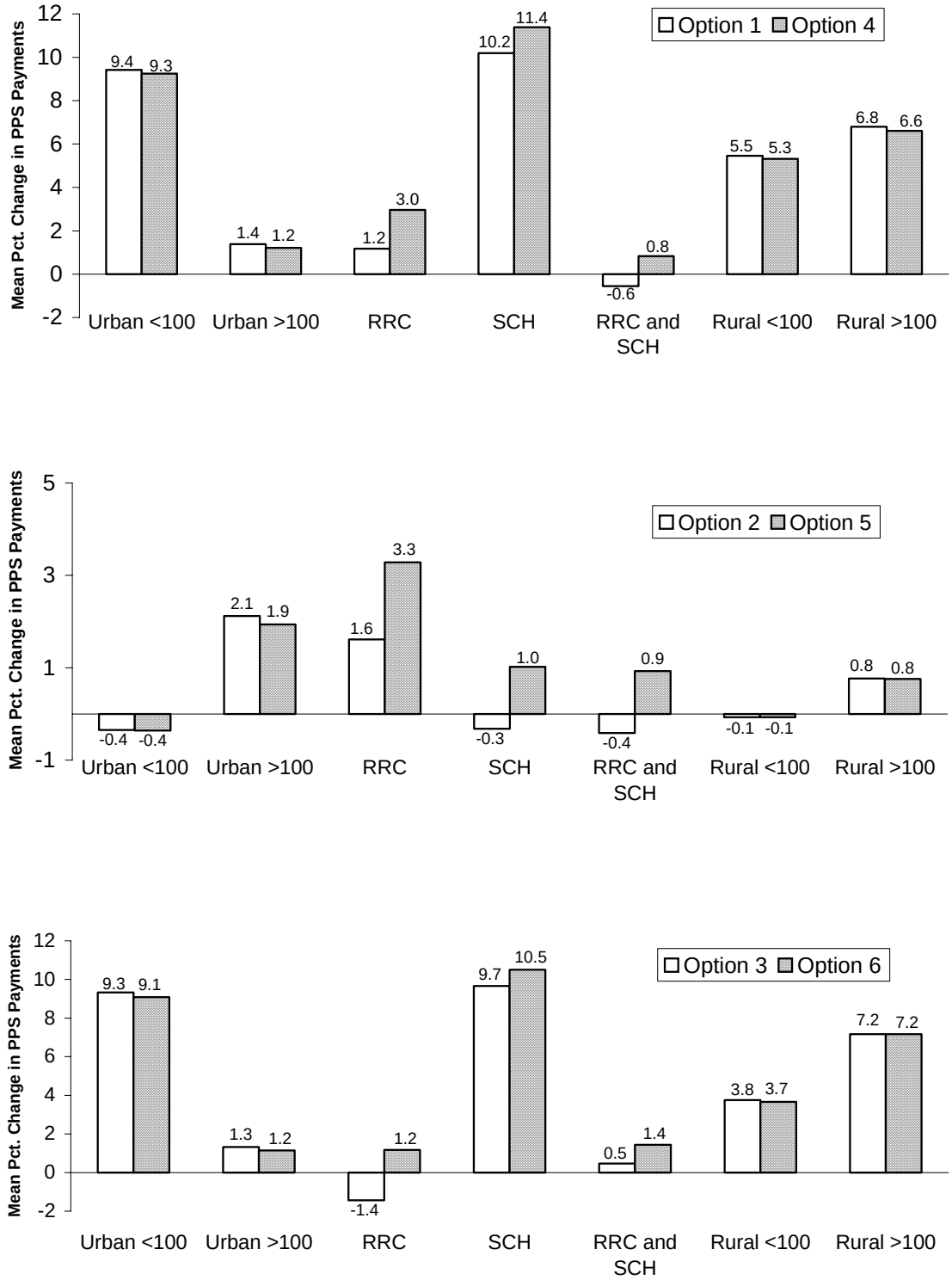
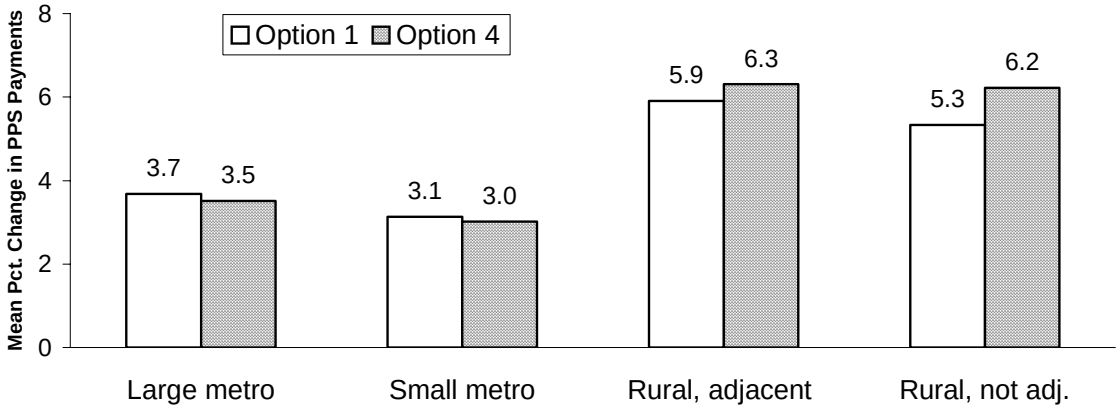
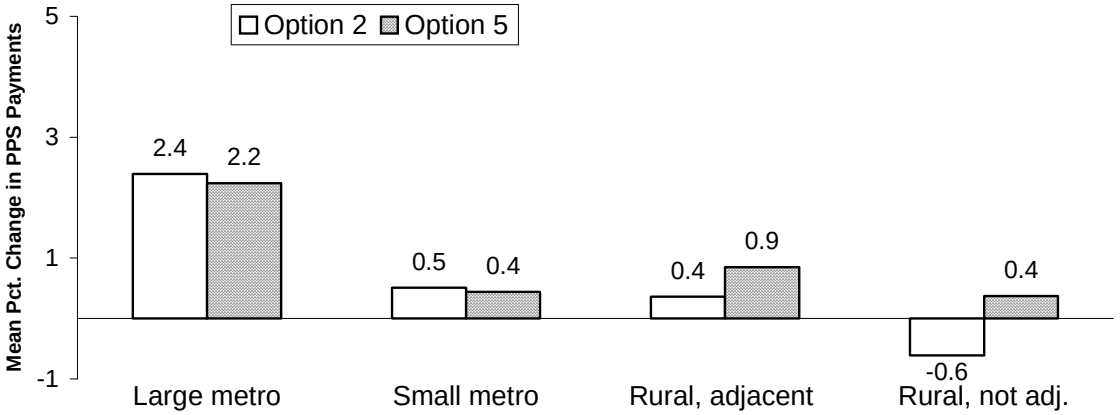


Figure 9. Comparison of Impact of Hold Harmless Provision, by Hospital Location





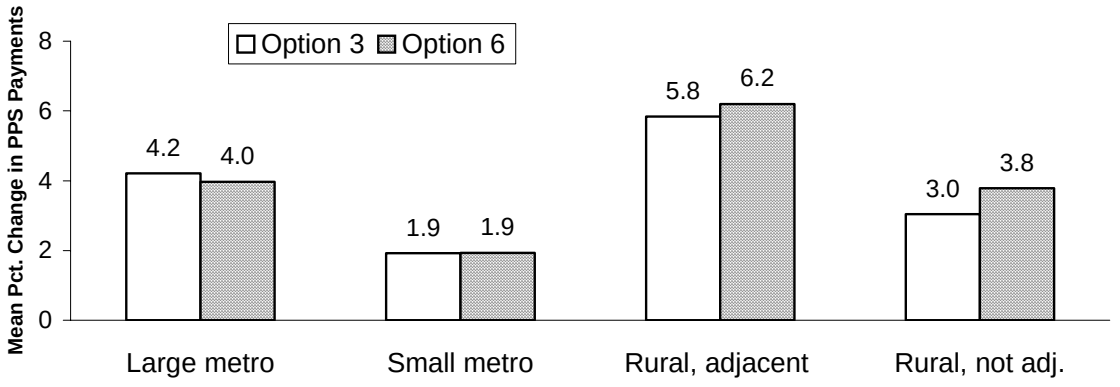
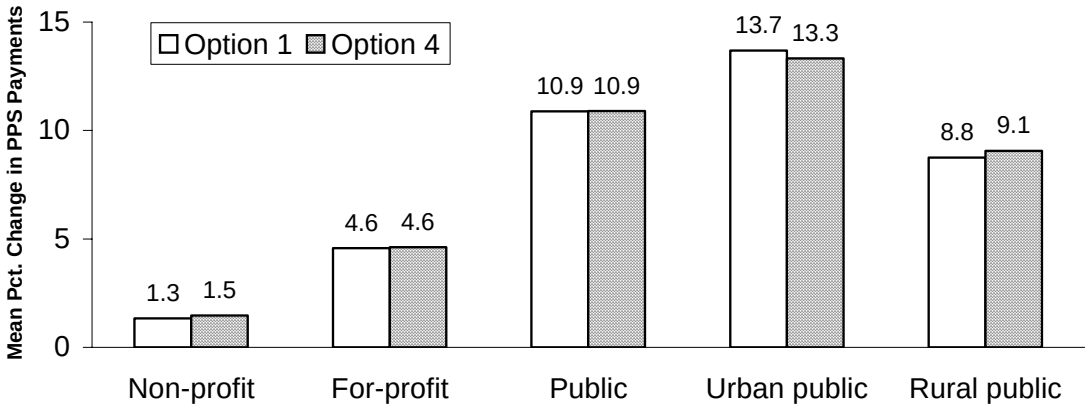
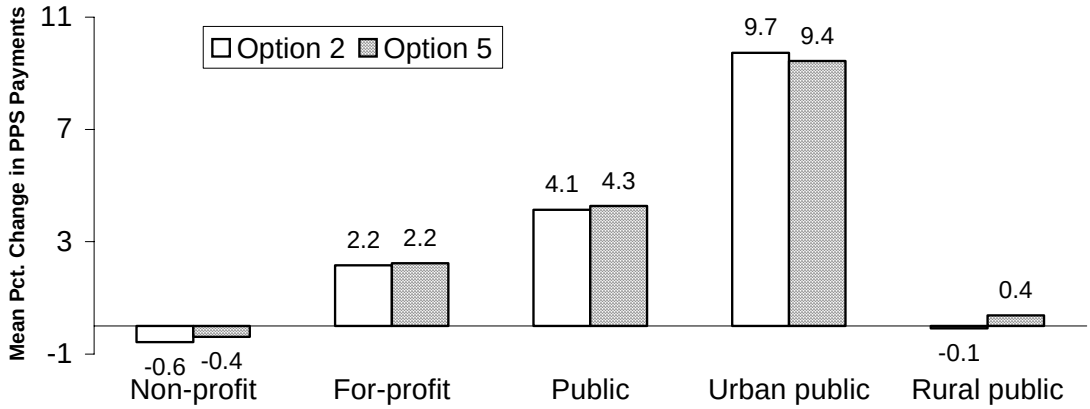


Figure 10. Comparison of Impact of Hold Harmless Provision, by Hospital Ownership





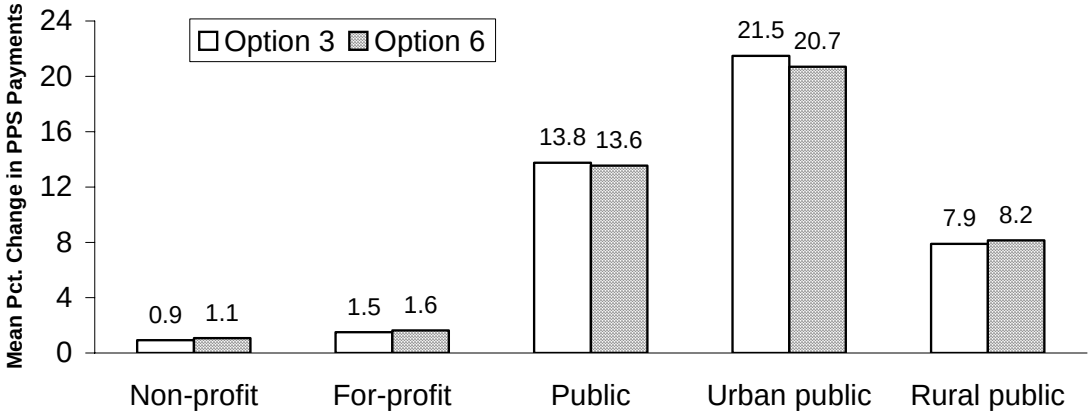
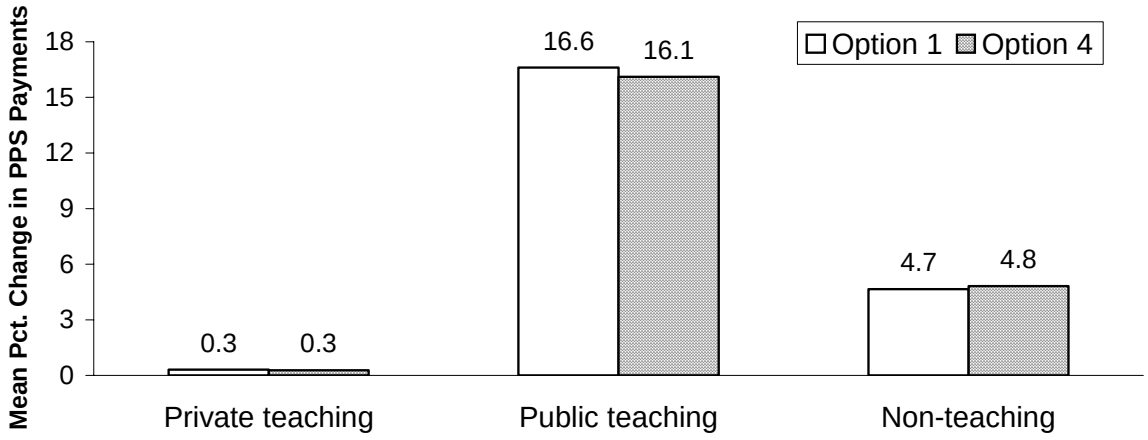
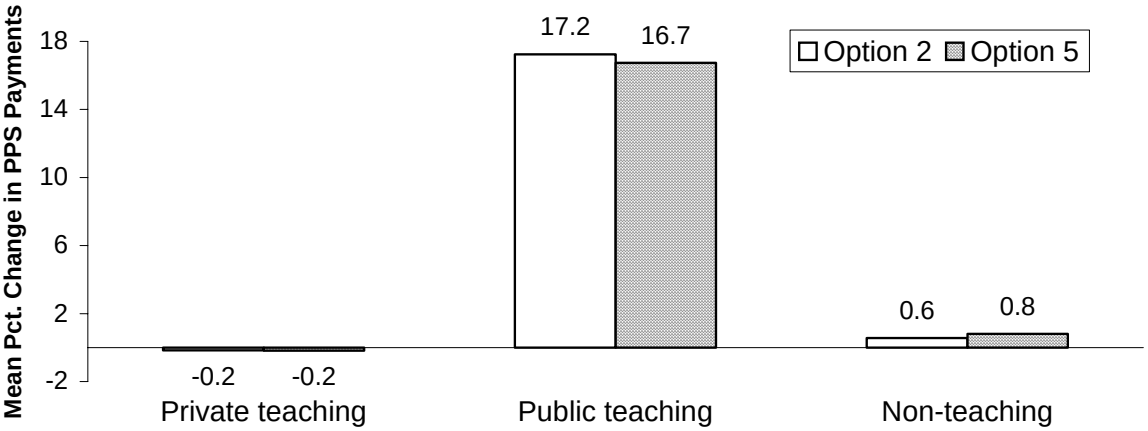
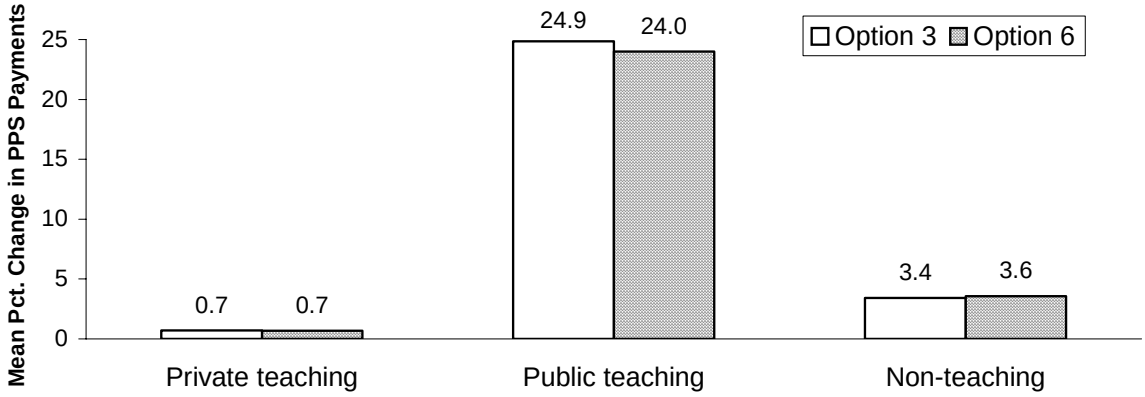


Figure 11. Comparison of Impact of Hold Harmless Provision, by Hospital Teaching Status







examine the number and types of hospitals that would experience either significant payment decreases or increases under each option.

Base Model (Option 1). Table 11 displays this information for Option 1. Depending on the threshold, the number of hospitals that could expect at least a 10 percent increase in payments is anywhere from 2.5 to 6 times greater than the number of hospitals expecting a payment decrease of comparable magnitude. As the threshold is relaxed, the number of both large winners and large losers falls since a fixed amount of DSH payments (in keeping with budget neutrality) is being distributed among more hospitals.

Throughout the threshold range considered, urban hospitals – and particularly those with more than 100 beds – are disproportionately more likely to be among the large losers under Option 1. For example, 69 percent of study hospitals are urban facilities, yet 87 to 100 percent of the large losers are urban facilities, depending on the qualifying threshold. Similarly, while 55 percent of study hospitals are large urban hospitals, these hospitals comprise 85 to 100 percent of the large losers.

The money lost by the large urban hospitals with significant payment decreases under Option 1 is being reallocated to smaller urban hospitals, SCHs, and other rural hospitals, including those in remote rural counties as well as those in counties adjacent to a metropolitan area. The appreciable gains by these types of hospitals are due to the fact that their DSH add-on percent is not capped under Option 1. As the threshold is relaxed so that more hospitals qualify, these types of hospitals are increasingly represented among the large winners. For example, the proportion of large winners that are rural hospitals increases from one-third to more than one-half as the threshold is lowered so that 70 percent of all hospitals qualify for DSH payments.

Among all ownership categories, voluntary non-profit hospitals would be disproportionately more likely to be among the large losers, while public hospitals would be more likely to be large winners. Public hospitals in urban areas receive a bigger boost by the more restrictive thresholds, while less restrictive thresholds increasingly favor public hospitals in rural areas.

Although public teaching hospitals are disproportionately represented among the large winners, particularly at the more restrictive thresholds, they are also disproportionately represented among large losers at all thresholds, indicating some wide swings in payments under Option 1. In fact, once the threshold is relaxed so that 70 percent of hospitals receive DSH payments, public teaching hospitals are more likely to experience large losses than to experience large gains (Figure 2 also illustrates how the more liberal thresholds erode the DSH payments to public teaching hospitals). Relative to their representation in the overall study population, private teaching hospitals are also disproportionately more likely to be large losers and less likely to be large winners. The large losses experienced by teaching hospitals finance the large gains earned by non-teaching hospitals under Option 1.

Option 1 is more likely to provide large gains to the hospitals in the worst financial position, and large losses to hospitals with high total margins. Regardless of threshold being considered, the average hospital expecting a large payment gain under Option 1 had a negative total margin prior to the payment change.

Table 11. Characteristics of Large Winners and Losers Under Option 1, by Qualifying Threshold

	All Study Hospitals	Percent of Hospitals Qualifying							
		40 Percent		50 Percent		60 Percent		70 Percent	
		≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain
Number of hospitals	954	74	183	47	188	27	161	22	131
Urban payment classification (%)	69.6	87.8	67.2	97.9	62.8	96.3	54.7	100.0	45.8
Rural payment classification	30.4	12.2	32.8	2.1	37.2	3.7	45.3	0.0	54.2
Metropolitan area	69.0	86.5	68.9	95.7	64.4	92.6	56.5	100.0	47.3
Nonmetropolitan (rural) area	31.0	13.5	31.2	4.3	35.6	7.4	43.5	0.0	52.7
Large metropolitan area	42.2	63.5	46.5	72.3	44.2	77.8	35.4	86.4	27.5
Small metropolitan area	26.7	23.0	22.4	23.4	20.2	14.8	21.1	13.6	19.9
Rural, adjacent to metro area	16.9	5.4	17.5	0.0	20.2	0.0	24.2	0.0	29.0
Rural, not adjacent to metro area	14.2	8.1	13.7	4.3	15.4	7.4	19.3	0.0	23.7
Urban, 1-99 beds	13.4	2.7	15.3	0.0	15.4	0.0	18.6	0.0	22.9
Urban, 100+ beds	54.5	85.1	48.6	97.9	44.2	96.3	32.9	100.0	19.1
Rural referral center	3.7	0.0	1.1	0.0	1.1	0.0	0.6	0.0	0.8
Sole community hospital	12.2	9.5	17.5	2.1	19.7	3.7	23.6	0.0	29.8
RRC and SCH	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other rural, 1-99 beds	14.5	2.7	16.4	0.0	18.6	0.0	23.0	0.0	26.0
Other rural, 100+ beds	0.9	0.0	1.1	0.0	1.1	0.0	1.2	0.0	1.5
Voluntary, non-profit	52.9	67.6	32.8	68.1	34.0	55.6	33.5	54.6	35.1
Proprietary	26.6	21.6	31.2	23.4	27.7	29.6	25.5	36.4	22.1
Government owned (public)	20.4	10.8	36.1	8.5	38.3	14.8	41.0	9.1	42.8
Urban, public	8.8	8.1	20.2	6.4	20.7	11.1	20.5	9.1	18.3
Rural, public	11.6	2.7	15.9	2.1	17.6	3.7	20.5	0.0	24.4
Private teaching hospital	23.5	46.0	16.9	53.2	14.9	40.7	10.6	36.4	7.6
Public teaching hospital	4.3	5.4	13.1	6.4	12.8	11.1	11.2	9.1	6.9
Non-teaching hospital	72.2	48.7	70.0	40.4	72.3	48.2	78.3	54.6	85.5
Top quartile, total margin	24.8	32.4	19.1	34.0	17.0	22.2	14.9	22.7	13.7
3rd quartile, total margin	24.7	40.5	18.6	46.8	17.6	59.3	15.5	45.5	17.6
2nd quartile, total margin	24.7	10.8	20.2	8.5	22.3	0.0	23.6	4.6	23.7
Bottom quartile, total margin	25.7	16.2	42.1	10.6	43.1	18.5	46.0	27.3	45.0
Total margin (mean)	3.2	6.3	-0.7	6.6	-1.1	2.2	-2.1	-1.4	-2.9
DPP ratio (mean)	24.2	22.0	48.7	21.3	47.2	22.6	45.4	27.7	43.0
SSI Medicare share (mean)	5.0	5.6	9.5	5.8	9.0	6.3	7.5	7.2	7.0
Medicaid share (mean)	13.9	12.6	30.6	12.0	29.4	13.0	28.3	17.2	26.1
Uncompensated care share (mean)	5.3	3.8	8.6	3.5	8.8	3.3	9.6	3.3	9.9

Finally, there are clear differences in the patient populations served by the large winners and the large losers. The large winners tend to derive a much larger share of their total revenue from Medicaid, and to provide above-average amounts of uncompensated care and care to low-income Medicare patients. In combination, these patterns of care result in much higher DPP ratios for the large winners than for the large losers. As expected, the new formula for calculating the DPP has more effectively targeted hospitals providing care to low-income and uninsured patients. This higher DPP ratio not only makes it more likely that these hospitals qualify for DSH payments, but also results in a higher DSH add-on percent for these hospitals.

Impact of the Cap on DSH Add-On Percents (Option 2). Imposing a 12 percent cap on DSH add-on percents for small urban hospitals, SCHs, and other rural hospitals (Option 2) has little impact on the types of hospitals that are large losers, but greatly reduces the likelihood that the hospitals facing the cap will be among the large winners. Instead, as can be seen by comparing Tables 11 and 12, urban hospitals with more than 100 beds, hospitals in large metropolitan areas, for-profit and urban public hospitals, and both public and private teaching hospitals are now much more likely to see their PPS payments increase by at least 10 percent, as payments in the budget neutral model are re-distributed from the hospitals facing the cap. This payment model continues to provide relatively more financial assistance to hospitals with great financial need, although hospitals in the lowest margin quartile are slightly less likely to experience large gains under Option 2 relative to Option 1. Finally, the mean DPP ratio for the large winners under Option 2 are several percentage points higher than those for large winners under Option 1, indicating that Option 2 more effectively targets those hospitals providing the largest amount of care to low-income and uninsured patients, as measured by the DPP ratio.

Impact of the Cap on DSH Payments (Option 3). A similar comparison of Tables 11 and 13 shows how the imposition of a cap on DSH payments relative to total gross revenue (Option 3) affects the distribution of large winners and losers. Because this cap applies to all hospitals, the impacts for particular categories of hospitals are not as dramatic as under Option 2. Although the shift would be less dramatic, this cap would also be expected to redistribute large gains away from rural hospitals to urban hospitals – especially to hospitals in large metropolitan counties and urban facilities with more than 100 beds. Large losses would also remain disproportionately concentrated among these types of urban hospitals, however. While rural public hospitals are less likely to have large gains under Option 3 than under Option 1, we would still expect to see these facilities disproportionately represented among the large winners relative to their representation in the study population.

Public teaching hospitals fare better under Option 3 than Option 1, while non-teaching hospitals (a category that includes most rural facilities) are more likely to experience large losses and less likely to experience large gains when the cap on DSH payments is imposed. This finding illustrates the fact that this type of cap is specifically designed so that hospitals with large Medicare shares do not experience windfall gains at the expense of hospitals that have traditionally been viewed as core safety-net providers.

Option 3 still provides disproportionately more gains to hospitals with the greatest financial need, but these gains are less concentrated among the low-margin hospitals than they would be under the uncapped model represented by Option 1. Notably, the likelihood that low-margin

Table 12. Characteristics of Large Winners and Losers Under Option 2, by Qualifying Threshold

	All Study Hospitals	Percent of Hospitals Qualifying							
		40 Percent		50 Percent		60 Percent		70 Percent	
		≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain
Number of hospitals	954	71	106	47	101	26	77	18	50
Urban payment classification (%)	69.6	87.3	96.2	97.9	94.1	96.2	92.2	100.0	82.0
Rural payment classification	30.4	12.7	3.8	2.1	5.9	3.9	7.8	0.0	18.0
Metropolitan area	69.0	85.9	96.2	95.7	94.1	92.3	92.2	100.0	82.0
Nonmetropolitan (rural) area	31.0	14.1	3.8	4.3	5.9	7.7	7.8	0.0	18.0
Large metropolitan area	42.2	63.4	73.6	72.3	71.3	76.9	68.8	88.9	60.0
Small metropolitan area	26.7	22.5	22.6	23.4	22.8	15.4	23.4	11.1	22.0
Rural, adjacent to metro area	16.9	5.6	1.9	0.0	3.0	0.0	3.9	0.0	12.0
Rural, not adjacent to metro area	14.2	8.5	1.9	4.3	3.0	7.7	3.9	0.0	6.0
Urban, 1-99 beds	13.4	2.8	2.8	0.0	4.0	0.0	6.5	0.0	14.0
Urban, 100+ beds	54.5	84.5	92.5	97.9	89.1	96.2	84.4	100.0	68.0
Rural referral center	3.7	0.0	1.9	0.0	2.0	0.0	2.6	0.0	2.0
Sole community hospital	12.2	9.9	0.9	2.1	2.0	3.9	2.6	0.0	8.0
RRC and SCH	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other rural, 1-99 beds	14.5	2.8	0.9	0.0	2.0	0.0	2.6	0.0	6.0
Other rural, 100+ beds	0.9	0.0	0.9	0.0	1.0	0.0	1.3	0.0	2.0
Voluntary, non-profit	52.9	67.6	32.1	68.1	32.7	53.9	35.1	55.6	30.0
Proprietary	26.6	21.1	39.6	23.4	36.6	30.8	29.9	33.3	32.0
Government owned (public)	20.4	11.3	28.3	8.5	30.7	15.4	35.1	11.1	38.0
Urban, public	8.8	8.5	27.4	6.4	28.7	11.5	32.5	11.1	32.0
Rural, public	11.6	2.8	0.9	2.1	2.0	3.9	2.6	0.0	6.0
Private teaching hospital	23.5	46.5	27.4	53.2	25.7	38.5	20.8	38.9	20.0
Public teaching hospital	4.3	5.6	22.6	6.4	22.8	11.5	24.7	11.1	18.0
Non-teaching hospital	72.2	47.9	50.0	40.4	51.5	50.0	54.6	50.0	62.0
Top quartile, total margin	24.8	32.4	21.7	34.0	21.8	23.1	16.9	27.8	18.0
3rd quartile, total margin	24.7	42.3	16.0	46.8	15.8	61.5	11.7	55.6	16.0
2nd quartile, total margin	24.7	11.3	23.6	8.5	23.8	0.0	29.9	0.0	26.0
Bottom quartile, total margin	25.7	14.1	38.7	10.6	38.6	15.4	41.6	16.7	40.0
Total margin (mean)	3.2	6.7	1.1	6.6	1.1	5.7	-0.9	1.6	-0.5
DPP ratio (mean)	24.2	21.6	52.7	21.3	52.1	22.1	51.2	26.1	45.8
SSI Medicare share (mean)	5.0	5.3	10.9	5.8	10.6	6.3	8.3	6.8	6.2
Medicaid share (mean)	13.9	12.5	33.7	12.0	32.9	12.6	32.5	16.1	27.7
Uncompensated care share (mean)	5.3	3.7	8.1	3.5	8.7	3.3	10.3	3.3	11.9

Table 13. Characteristics of Large Winners and Losers Under Option 3, by Qualifying Threshold

	All Study Hospitals	Percent of Hospitals Qualifying					
		50 Percent		60 Percent		70 Percent	
		≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain
Number of hospitals	954	62	152	52	139	43	114
Urban payment classification (%)	69.6	96.8	69.1	96.2	66.9	97.7	60.5
Rural payment classification	30.4	3.2	30.9	3.9	33.1	2.3	39.5
Metropolitan area	69.0	93.6	71.1	92.3	69.1	95.4	63.2
Nonmetropolitan (rural) area	31.0	6.5	29.0	7.7	30.9	4.7	36.8
Large metropolitan area	42.2	69.4	51.3	75.0	47.5	76.7	40.4
Small metropolitan area	26.7	24.2	19.7	17.3	21.6	18.6	22.8
Rural, adjacent to metro area	16.9	3.2	17.8	3.9	19.4	4.7	23.7
Rural, not adjacent to metro area	14.2	3.2	11.2	3.9	11.5	0.0	13.2
Urban, 1-99 beds	13.4	0.0	17.1	0.0	20.1	0.0	26.3
Urban, 100+ beds	54.5	95.2	48.7	94.2	43.2	95.4	29.8
Rural referral center	3.7	3.2	0.0	3.9	0.0	4.7	0.0
Sole community hospital	12.2	1.6	17.1	1.9	19.4	0.0	23.7
RRC and SCH	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Other rural, 1-99 beds	14.5	0.0	14.5	0.0	14.4	0.0	17.5
Other rural, 100+ beds	0.9	0.0	2.6	0.0	2.9	0.0	2.6
Voluntary, non-profit	52.9	56.5	32.9	48.1	30.9	48.8	33.3
Proprietary	26.6	35.5	28.3	44.2	27.3	48.8	21.1
Government owned (public)	20.4	8.1	38.8	7.7	41.7	2.3	45.6
Urban, public	8.8	6.5	23.7	5.8	25.2	2.3	25.4
Rural, public	11.6	1.6	15.1	1.9	16.6	0.0	20.2
Private teaching hospital	23.5	37.1	19.1	34.6	18.7	32.6	11.4
Public teaching hospital	4.3	4.8	16.5	3.9	17.3	0.0	15.8
Non-teaching hospital	72.2	58.1	64.5	61.5	64.0	67.4	72.8
Top quartile, total margin	24.8	24.2	21.7	17.3	23.0	14.0	19.3
3rd quartile, total margin	24.7	40.3	13.8	40.4	11.5	37.2	13.2
2nd quartile, total margin	24.7	12.9	28.3	13.5	28.1	16.3	28.1
Bottom quartile, total margin	25.7	22.6	36.2	28.9	37.4	32.6	39.5
Total margin (mean)	3.2	4.0	0.6	2.4	0.2	0.9	-1.3
DPP ratio (mean)	24.2	39.3	38.9	43.3	39.9	49.3	39.9
SSI Medicare share (mean)	5.0	12.1	5.5	13.7	5.5	15.7	5.0
Medicaid share (mean)	13.9	21.7	25.9	23.8	26.6	27.3	26.2
Uncompensated care share (mean)	5.3	5.5	7.5	5.8	7.9	6.3	8.7

hospitals would experience a large loss has increased under Option 3 relative to Option 1, although large losses would continue to be concentrated among hospitals in the top half of the margin distribution.

Finally, the imposition of the Option 3 cap has caused a change in the mean DPP values of large winners and losers. Whereas the large winners under Option 1 (and Option 2) had a much higher mean DPP value than the large losers – indicating effective targeting of DSH payments – the mean DPP values under Option 3 are much more similar for the large winners and losers. Under both the 50- and 60-percent thresholds, the mean ratios for winners and loser are roughly the same, while under the 70-percent threshold the mean DPP value for large losers is nearly 10 percentage points above the DPP ratio for large winners.

Impact of the Hold Harmless Provision (Options 4 through 6). Results for Options 4 through 6 are presented in Tables 14 through 16. Since Options 4 through 6 are identical to Options 1 through 3, respectively, except for the addition of the hold harmless provision for RRCs and SCHs, these tables should be compared with Tables 11 through 13 to isolate the impact of the hold harmless protection. These comparisons show that the hold harmless protection has necessarily kept RRCs and SCHs from being among the large losers (indeed, from incurring any losses whatsoever), and resulted in small increases in the probability that large losers will be drawn from other categories of hospitals (especially urban facilities). The changes in the percents shown in the tables are typically quite small, however, and most often attributed to changes in the results for only a few hospitals. More generally, the pattern and magnitude of most results in Tables 14 through 16 are not appreciably different from those of Tables 11 through 13. Thus a hold harmless protection would help RRCs and SCHs without having a dramatic negative effect on DSH payments to other categories of hospitals. This result is possible because only one in every six study hospitals is eligible for the hold harmless provision, and even fewer actually receive protection under this provision.

5.0 DISCUSSION

Despite the flurry of interest in the late 1990s and early 2000s in revising the Medicare DSH payment system, and despite provisions in the Balanced Budget Refinement Act of 1999 mandating the collection of data on hospitals' charity care and bad debt, little has happened in recent years to advance this issue on the Medicare policy agenda. This study has illustrated how uncompensated care data could be incorporated into a revised DSH payment system and explored the distributional impacts of several alternative payment formulae. By and large, these simulation results indicate that the public teaching (and mostly urban) hospitals that are the backbone of the traditional safety net system would fare well under all of the options considered, unless qualifying thresholds are set at extremely liberal levels that would permit nearly all hospitals to receive DSH payments. In that case, the budget neutrality constraint that we have imposed necessarily redirects DSH payments away from higher DPP hospitals in order to spread the fixed DSH dollars among the larger number of qualifying hospitals.

All options also tend to help the hospitals in the greatest financial need, as measured by their total margin (computed prior to any change in the DSH payment system). Thus, any of the DSH

Table 14. Characteristics of Large Winners and Losers Under Option 4, by Qualifying Threshold

	All Study Hospitals	Percent of Hospitals Qualifying							
		40 Percent		50 Percent		60 Percent		70 Percent	
		≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain
Number of hospitals	954	68	180	46	182	26	157	23	130
Urban payment classification (%)	69.6	97.1	67.8	100.0	61.5	100.0	53.5	100.0	45.4
Rural payment classification	30.4	2.9	32.2	0.0	38.5	0.0	46.5	0.0	54.6
Metropolitan area	69.0	95.6	68.9	97.8	63.2	96.2	55.4	100.0	46.9
Nonmetropolitan (rural) area	31.0	4.4	31.1	2.2	36.8	3.9	44.6	0.0	53.1
Large metropolitan area	42.2	69.1	47.2	73.9	42.9	80.8	35.0	82.6	26.9
Small metropolitan area	26.7	26.5	21.7	23.9	20.3	15.4	20.4	17.4	20.0
Rural, adjacent to metro area	16.9	1.5	17.8	0.0	20.9	0.0	24.8	0.0	29.2
Rural, not adjacent to metro area	14.2	2.9	13.3	2.2	15.9	3.9	19.8	0.0	23.9
Urban, 1-99 beds	13.4	2.9	15.0	0.0	15.9	0.0	19.1	0.0	23.1
Urban, 100+ beds	54.5	94.1	49.4	100.0	42.3	100.0	31.2	100.0	18.5
Rural referral center	3.7	0.0	1.1	0.0	1.1	0.0	0.6	0.0	0.8
Sole community hospital	12.2	0.0	17.8	0.0	20.3	0.0	24.2	0.0	30.0
RRC and SCH	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other rural, 1-99 beds	14.5	2.9	15.6	0.0	19.2	0.0	23.6	0.0	26.2
Other rural, 100+ beds	0.9	0.0	1.1	0.0	1.1	0.0	1.3	0.0	1.5
Voluntary, non-profit	52.9	67.7	32.8	69.6	32.4	57.7	33.8	52.2	34.6
Proprietary	26.6	22.1	30.6	23.9	28.6	30.8	24.8	39.1	22.3
Government owned (public)	20.4	10.3	36.7	6.5	39.0	11.5	41.4	8.7	43.1
Urban, public	8.8	8.8	20.6	6.5	20.9	11.5	20.4	8.7	18.5
Rural, public	11.6	1.5	16.1	0.0	18.1	0.0	21.0	0.0	24.6
Private teaching hospital	23.5	51.5	17.2	54.4	14.8	42.3	10.8	34.8	7.7
Public teaching hospital	4.3	5.9	13.3	6.5	12.6	11.5	10.8	8.7	6.9
Non-teaching hospital	72.2	42.7	69.4	39.1	72.5	46.2	78.3	56.5	85.4
Top quartile, total margin	24.8	32.4	18.9	34.8	17.0	23.1	14.0	21.7	13.9
3rd quartile, total margin	24.7	41.2	18.9	45.7	18.1	57.7	15.9	43.5	17.7
2nd quartile, total margin	24.7	10.3	20.6	8.7	23.1	0.0	24.2	4.4	23.1
Bottom quartile, total margin	25.7	16.2	41.7	10.9	41.8	19.2	45.9	30.4	45.4
Total margin (mean)	3.2	6.4	-0.7	6.7	-1.0	2.1	-2.4	-2.5	-2.9
DPP ratio (mean)	24.2	22.1	48.9	21.4	47.4	22.8	45.4	28.2	42.9
SSI Medicare share (mean)	5.0	5.7	9.6	5.9	9.1	6.4	7.5	7.5	7.0
Medicaid share (mean)	13.9	12.6	30.8	12.0	29.4	13.1	28.3	17.0	26.0
Uncompensated care share (mean)	5.3	3.7	8.6	3.5	8.9	3.3	9.6	3.6	9.9

Table 15. Characteristics of Large Winners and Losers Under Option 5, by Qualifying Threshold

	All Study Hospitals	Percent of Hospitals Qualifying							
		40 Percent		50 Percent		60 Percent		70 Percent	
		≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain
Number of hospitals	954	64	103	46	101	25	75	20	48
Urban payment classification (%)	69.6	96.9	96.1	100.0	94.1	100.0	92.0	100.0	81.3
Rural payment classification	30.4	3.1	3.9	0.0	5.9	0.0	8.0	0.0	18.8
Metropolitan area	69.0	95.3	96.1	97.8	94.1	96.0	92.0	100.0	81.3
Nonmetropolitan (rural) area	31.0	4.7	3.9	2.2	5.9	4.0	8.0	0.0	18.8
Large metropolitan area	42.2	70.3	73.8	73.9	71.3	80.0	68.0	90.0	58.3
Small metropolitan area	26.7	25.0	22.3	23.9	22.8	16.0	24.0	10.0	22.9
Rural, adjacent to metro area	16.9	1.6	1.9	0.0	3.0	0.0	4.0	0.0	12.5
Rural, not adjacent to metro area	14.2	3.1	1.9	2.2	3.0	4.0	4.0	0.0	6.3
Urban, 1-99 beds	13.4	3.1	2.9	0.0	4.0	0.0	6.7	0.0	14.6
Urban, 100+ beds	54.5	93.8	92.2	100.0	89.1	100.0	84.0	100.0	66.7
Rural referral center	3.7	0.0	1.9	0.0	2.0	0.0	2.7	0.0	2.1
Sole community hospital	12.2	0.0	1.0	0.0	2.0	0.0	2.7	0.0	8.3
RRC and SCH	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other rural, 1-99 beds	14.5	3.1	1.0	0.0	2.0	0.0	2.7	0.0	6.3
Other rural, 100+ beds	0.9	0.0	1.0	0.0	1.0	0.0	1.3	0.0	2.1
Voluntary, non-profit	52.9	67.2	32.0	69.6	32.7	56.0	34.7	50.0	29.2
Proprietary	26.6	21.9	39.8	23.9	36.6	32.0	29.3	40.0	31.3
Government owned (public)	20.4	10.9	28.2	6.5	30.7	12.0	36.0	10.0	39.6
Urban, public	8.8	9.4	27.2	6.5	28.7	12.0	33.3	10.0	33.3
Rural, public	11.6	1.6	1.0	0.0	2.0	0.0	2.7	0.0	6.3
Private teaching hospital	23.5	51.6	28.2	54.4	25.7	40.0	20.0	35.0	18.8
Public teaching hospital	4.3	6.3	23.3	6.5	22.8	12.0	25.3	10.0	18.8
Non-teaching hospital	72.2	42.2	48.5	39.1	51.5	48.0	54.7	55.0	62.5
Top quartile, total margin	24.8	32.8	22.3	34.8	21.8	24.0	16.0	25.0	18.8
3rd quartile, total margin	24.7	42.2	15.5	45.7	15.8	60.0	12.0	50.0	14.6
2nd quartile, total margin	24.7	10.9	24.3	8.7	23.8	0.0	30.7	5.0	27.1
Bottom quartile, total margin	25.7	14.1	37.9	10.9	38.6	16.0	41.3	20.0	39.6
Total margin (mean)	3.2	6.9	1.2	6.7	1.1	5.8	-1.1	0.8	-0.4
DPP ratio (mean)	24.2	21.6	53.0	21.4	52.1	22.4	50.9	27.6	45.3
SSI Medicare share (mean)	5.0	5.5	11.0	5.9	10.6	6.4	7.7	7.5	5.8
Medicaid share (mean)	13.9	12.5	33.9	12.0	32.9	12.6	32.6	16.7	27.6
Uncompensated care share (mean)	5.3	3.7	8.2	3.5	8.7	3.3	10.6	3.4	12.0

Table 16. Characteristics of Large Winners and Losers Under Option 6, by Qualifying Threshold

	All Study Hospitals	Percent of Hospitals Qualifying					
		50 Percent		60 Percent		70 Percent	
		≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain	≥10% Loss	≥10% Gain
Number of hospitals	954	59	149	49	135	42	113
Urban payment classification (%)	69.6	100.0	69.8	100.0	66.7	100.0	60.2
Rural payment classification	30.4	0.0	30.2	0.0	33.3	0.0	39.8
Metropolitan area	69.0	96.6	71.8	95.9	68.9	97.6	62.8
Nonmetropolitan (rural) area	31.0	3.4	28.2	4.1	31.1	2.4	37.2
Large metropolitan area	42.2	72.9	51.7	79.6	47.4	81.0	39.8
Small metropolitan area	26.7	23.7	20.1	16.3	21.5	16.7	23.0
Rural, adjacent to metro area	16.9	1.7	17.5	2.0	19.3	2.4	23.9
Rural, not adjacent to metro area	14.2	1.7	10.7	2.0	11.9	0.0	13.3
Urban, 1-99 beds	13.4	0.0	17.5	0.0	20.7	0.0	26.6
Urban, 100+ beds	54.5	100.0	49.0	100.0	42.2	100.0	29.2
Rural referral center	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Sole community hospital	12.2	0.0	17.5	0.0	19.3	0.0	23.9
RRC and SCH	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Other rural, 1-99 beds	14.5	0.0	13.4	0.0	14.8	0.0	17.7
Other rural, 100+ beds	0.9	0.0	2.7	0.0	3.0	0.0	2.7
Voluntary, non-profit	52.9	57.6	32.9	49.0	30.4	47.6	33.6
Proprietary	26.6	35.6	28.2	44.9	27.4	50.0	21.2
Government owned (public)	20.4	6.8	38.9	6.1	42.2	2.4	45.1
Urban, public	8.8	6.8	24.2	6.1	25.9	2.4	24.8
Rural, public	11.6	0.0	14.8	0.0	16.3	0.0	20.4
Private teaching hospital	23.5	39.0	18.8	36.7	17.8	33.3	11.5
Public teaching hospital	4.3	5.1	16.8	4.1	17.8	0.0	15.0
Non-teaching hospital	72.2	55.9	64.4	59.2	64.4	66.7	73.5
Top quartile, total margin	24.8	25.4	22.2	18.4	23.0	16.7	18.6
3rd quartile, total margin	24.7	40.7	13.4	40.8	11.9	38.1	13.3
2nd quartile, total margin	24.7	10.2	28.2	10.2	28.2	11.9	28.3
Bottom quartile, total margin	25.7	23.7	36.2	30.6	37.1	33.3	39.8
Total margin (mean)	3.2	4.1	0.5	2.4	0.1	1.4	-1.8
DPP ratio (mean)	24.2	39.2	39.2	43.4	40.3	48.4	39.7
SSI Medicare share (mean)	5.0	12.4	5.6	14.2	5.5	15.9	5.0
Medicaid share (mean)	13.9	22.1	26.1	24.3	26.9	27.3	26.0
Uncompensated care share (mean)	5.3	4.8	7.6	4.9	7.9	5.1	8.8

options we have modeled would further the goal of protecting beneficiary access to care by providing financial assistance to hospitals at the greatest risk of closure.

Not surprisingly, implementing the new DSH payment formulae without a cap on add-on percents (Option 1) would significantly increase the DSH payments made to those categories of hospitals now facing the cap, which includes most rural hospitals as well as small urban facilities. These gains disappear when the cap is reintroduced (Option 2), and at more restrictive qualifying thresholds, most rural and small hospitals would expect their total PPS payments to be lower under the new system as fewer of these facilities qualify for DSH payments.

Using a hospital-specific cap that limits total DSH payments as a percent of gross patient revenue (Option 3) does have the intended impact of preventing large windfall gains by hospitals that are not among the top providers of care to low-income uninsured patients (e.g., rural hospitals with large Medicare patient populations). However, the average rural hospital would still fare better than the average urban hospital under this scenario.

Finally, the hold harmless protections we included for RRCs and SCHs in Options 4 through 6 necessarily assisted the targeted hospitals. Although the budget neutrality constraint means that these protections came at the expense of other types of hospitals, including other rural facilities, the negative impact on these other categories of hospitals was typically small due to the relatively small number of RRCs and SCHs actually held harmless by the provisions.

These findings are subject to a number of caveats that should be borne in mind. First, the results are based on the experiences of just 9 states that could supply the necessary data. Although we were able to include a good mix of states from across the country and had adequate representation of different types of urban and rural facilities, study findings may not be generalizable to the nation. In particular, our study states had more hospitals from large metropolitan areas than the nation as a whole (42.2 vs. 34.5 percent), and correspondingly lower representation of hospitals from remote rural areas (14.2 vs. 20.4 percent). Second, other than basic data cleaning, we have not conducted any assessment of the quality of the financial data provided by the states. We have assumed that the dollar values are correctly reported, and that they reflect the same concepts and definitions in each state. Third, also due to data limitations, we were unable to implement fully MedPAC's recommendation regarding the inclusion of patients treated through other state and local indigent care programs. The difficulties we encountered in obtaining consistent financial data from even 9 states underscore the difficulty of collecting this information from all Medicare-certified hospitals and implementing a revised DSH system on a national basis – especially absent further federal action to mandate submission of the requisite data and promulgate rules for how the data items are to be defined.

Our results are also dependent on the specifications of the options we have chosen to model. Varying the way the add-on percent is calculated, imposing different caps on the add-on percent or add-on amount, applying these caps to different categories of hospitals, or protecting different categories of hospitals through hold harmless provisions, would certainly change the absolute magnitude of the results reported here for specific groups of hospitals and might also change the relative patterns of results.

Finally, we would expect different results if changes to the DSH payment system are not implemented in a budget neutral manner, since gains by one group of hospitals would not have to be offset through relative losses by other categories of hospitals. While we elected to implement budget neutral models in the belief that this represents the most realistic policy option, it would also be possible to implement the same basic add-on percent formula [AOP = (DPP - Threshold) * PCT] without imposing absolute budget neutrality. In this case, one would need either to set some type of overall budget constraint so that the model could be solved for a PCT value or set a value for PCT *a priori*.

If a budget constraint is to be specified, this amount could be above or below (or the same as) the amount of money currently spent on DSH payments. The PCT value that is calculated for a given budget constraint will also be dependent on the exact specification of the model – including all provisions about caps and hold harmless protections as well as the DPP threshold used to determine qualification for DSH payments. For example, the PCT values that solved the AOP equation under the budget neutrality constraint for our study hospitals ranged from approximately 0.5 if all hospitals receive DSH payments to 16 or 17 percent (depending on the option) for the threshold that qualifies only 10 percent of hospitals. For the 40-to-70 percent threshold range that we believe is most appropriate, these values ranged from about 1.5 percent at the 70-percent threshold to about 3 percent at the 40-percent threshold.[5] In other words, if 70 percent of our study hospitals were permitted to qualify for DSH payments, an increase in PPS payments of roughly 1.5 percent for every percentage point that a hospital's DPP exceeds the qualifying threshold would approximately maintain budget neutrality, regardless of the option being modeled.

If a value for PCT is to be specified *a priori*, rather than imposing a budget constraint, one still would presumably want to choose this value with some consideration for the total budget impact. While the above discussion about PCT values may provide some approximate guidance in selecting an initial starting point, system designers would need to experiment with a range of PCT values to determine the full budget implications given the exact parameters of the redesigned payment system and data on universe of hospitals that would be covered by the system.

[5] Options 3 and 6 could not be implemented for a 40-percent threshold under budget neutrality. PCT was equal to about 6 percent for the 50-percent threshold for these two options.

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Medicare Payment Advisory Commission (MedPAC). "Report to the Congress: Medicare Payment Policy." Volume I. Washington, D.C.: MedPAC. March 1998.

Medicare Payment Advisory Commission (MedPAC). "Report to the Congress: Medicare Payment Policy." Washington, D.C.: MedPAC. March 2000.

Medicare Payment Advisory Commission (MedPAC). "Increasing Disproportionate Share Payments to Rural Hospitals." Memo from Jack Ashby to Congressional Staff. July 25, 2000.

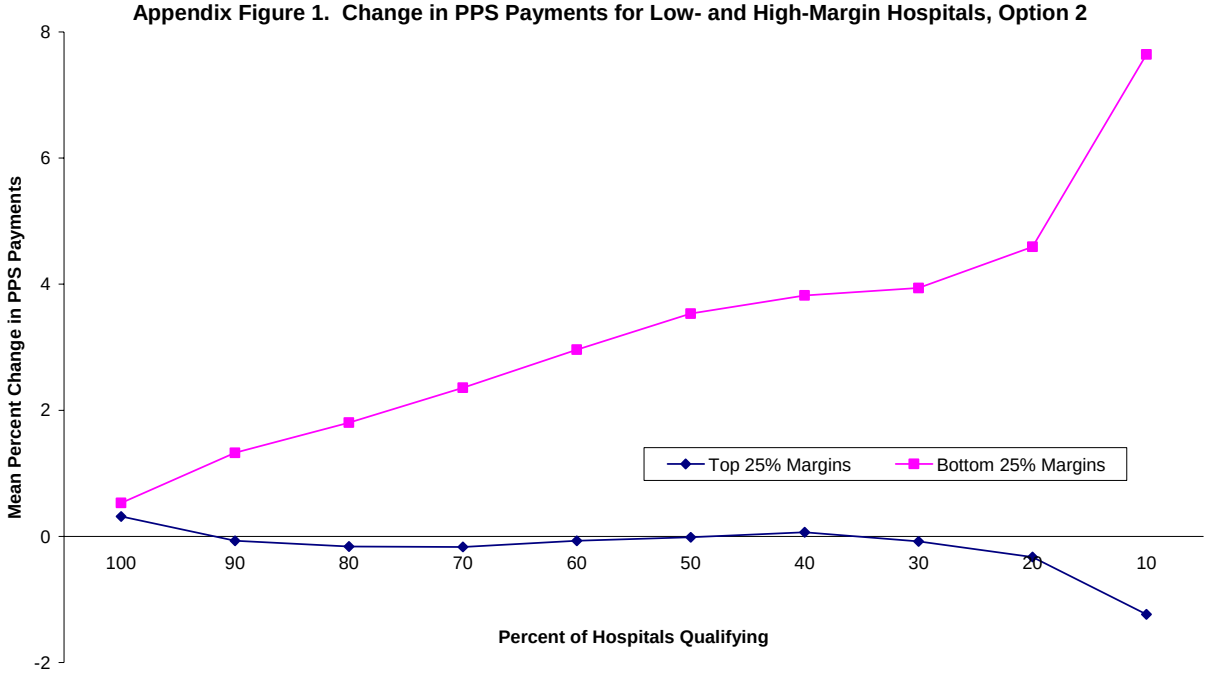
Medicare Payment Advisory Commission (MedPAC). "Report to the Congress: Medicare Payment Policy." Washington, D.C.: MedPAC. March 2001.

Appendix A.

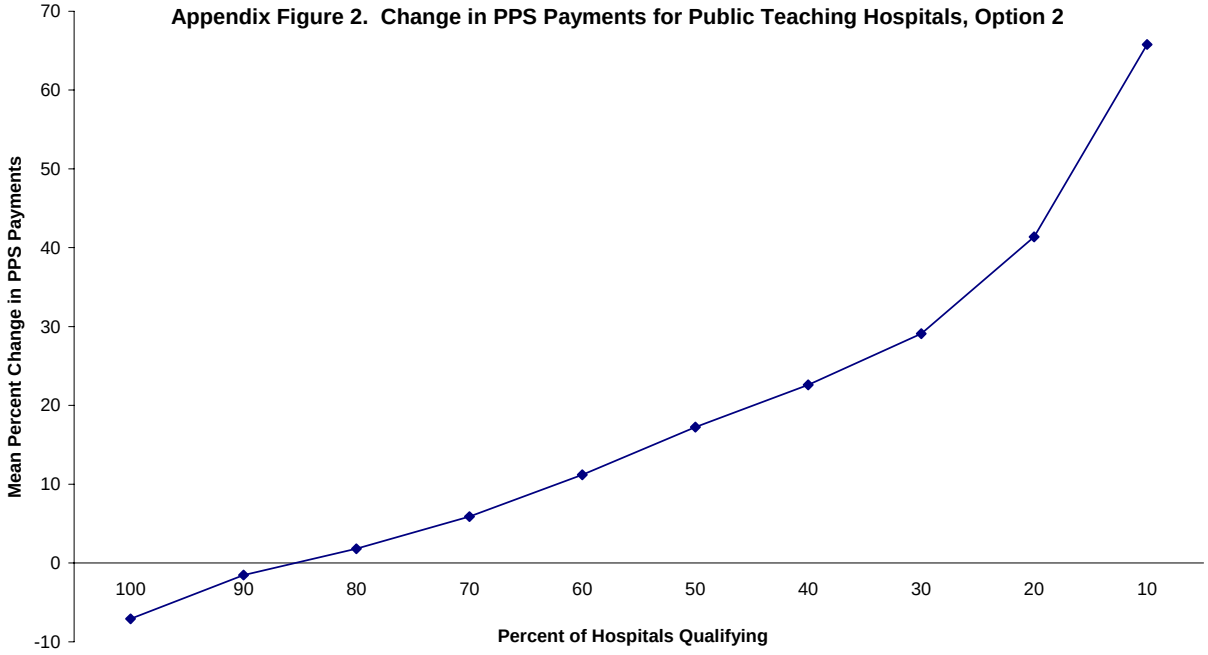
Analysis of Financial Impact of Various Qualifying Thresholds
Modeling Options 2 through 6

Option 2

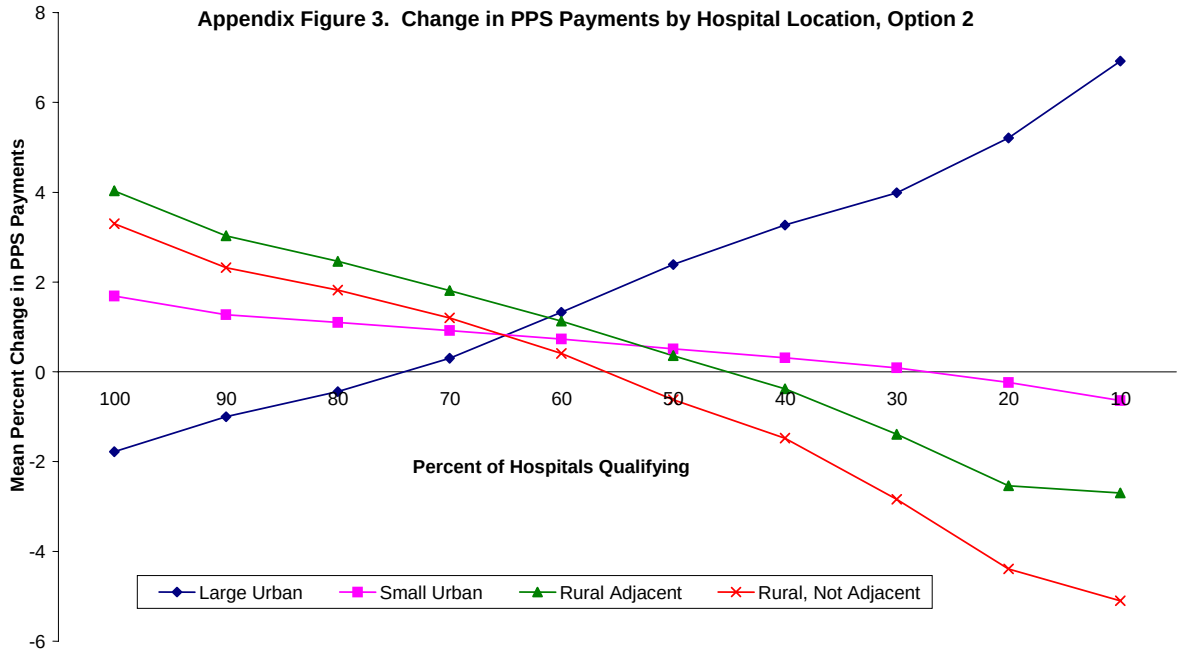
Appendix Figure 1. Change in PPS Payments for Low- and High-Margin Hospitals, Option 2



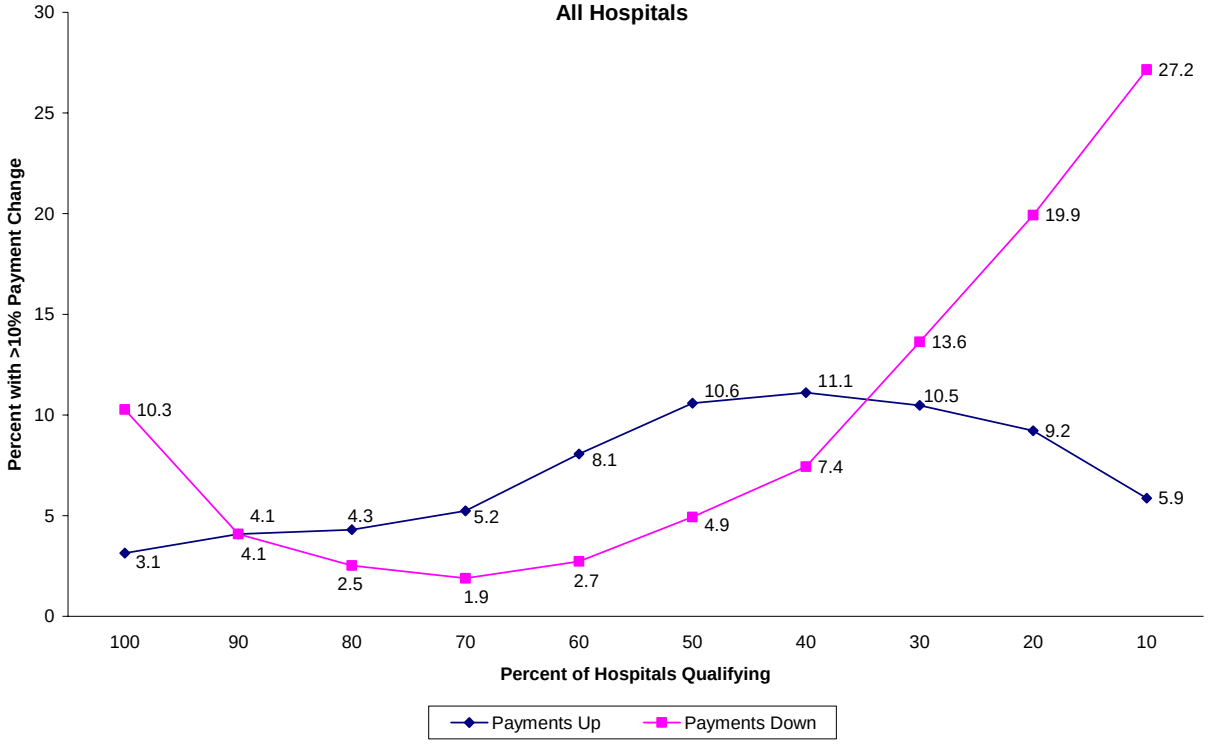
Appendix Figure 2. Change in PPS Payments for Public Teaching Hospitals, Option 2



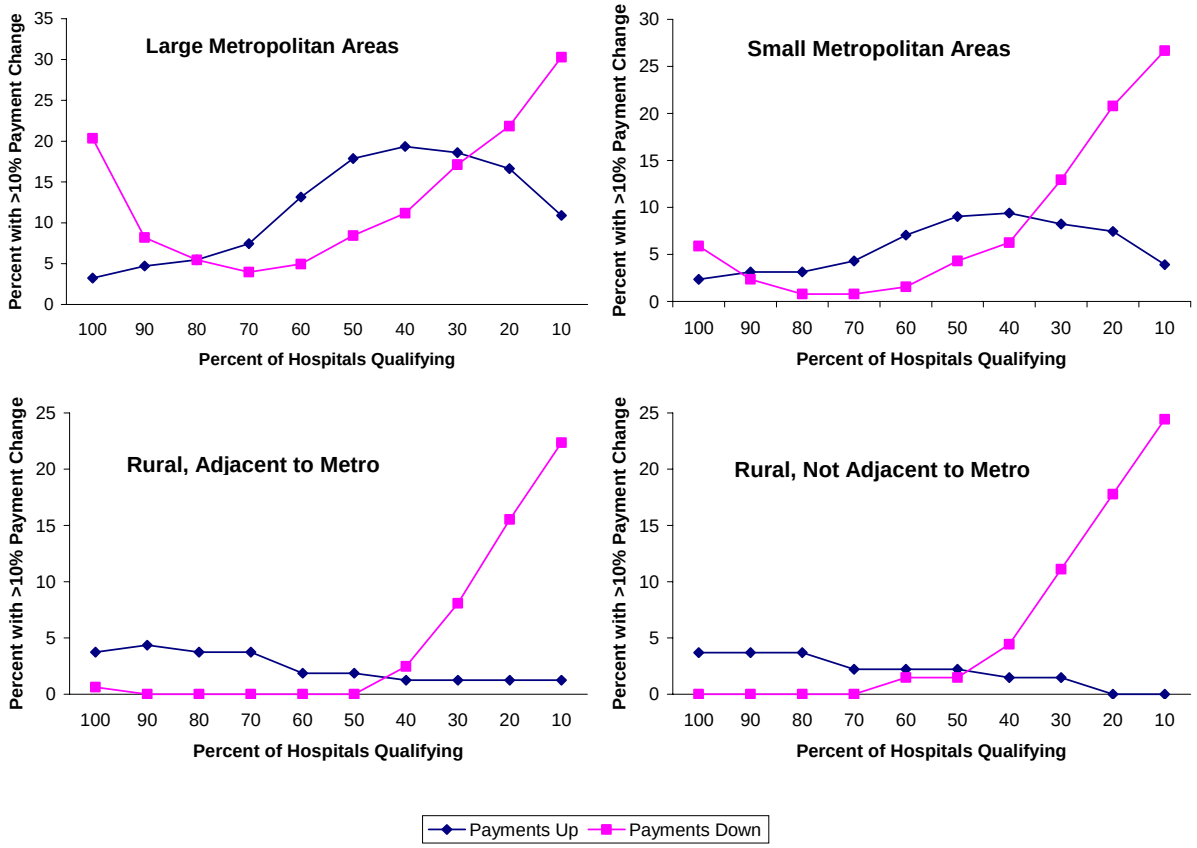
Appendix Figure 3. Change in PPS Payments by Hospital Location, Option 2



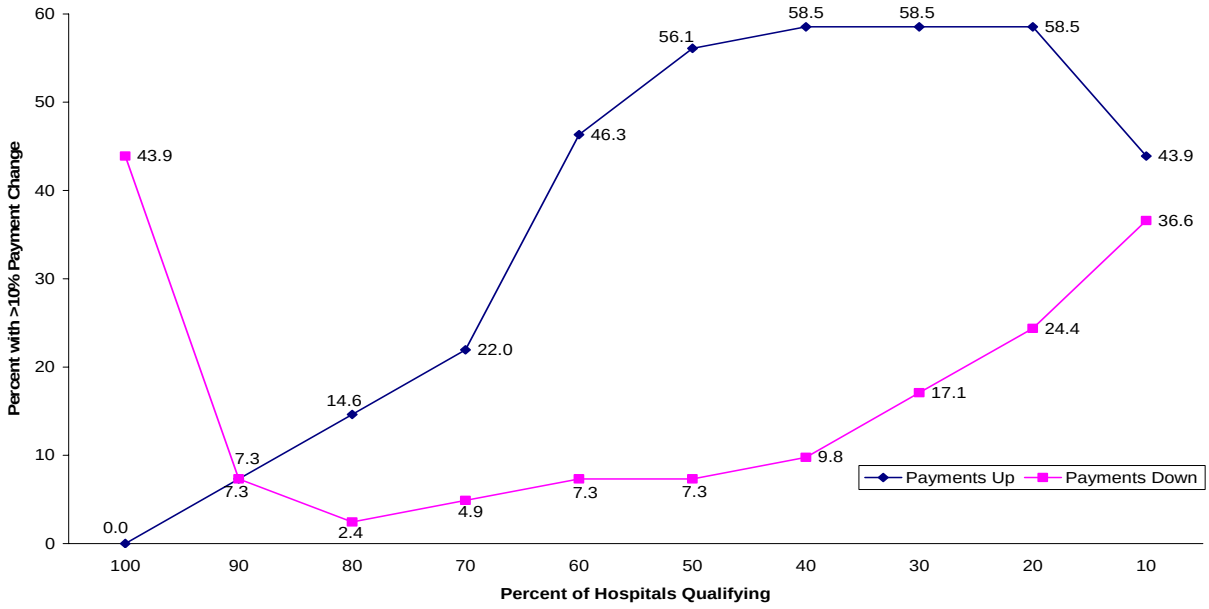
Appendix Figure 4. Big Winners and Losers under Option 2, by Qualifying Threshold, All Hospitals



Appendix Figure 5. Big Winners and Losers under Option 2, by Qualifying Threshold and Hospital Location

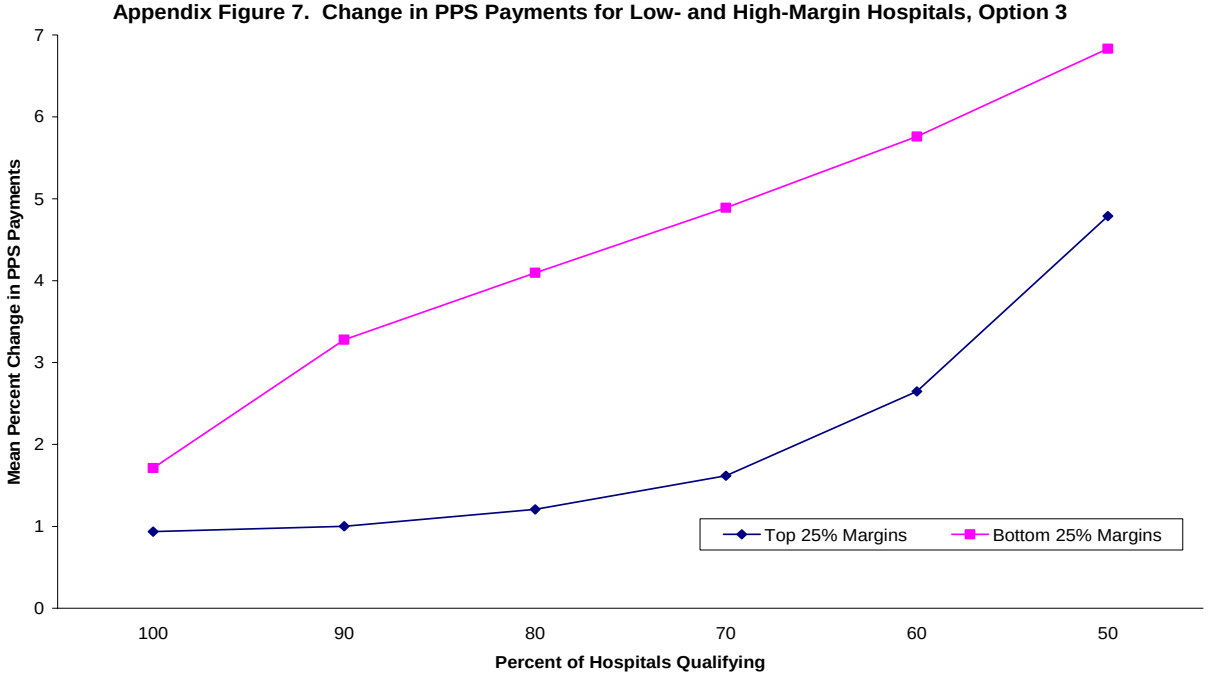


Appendix Figure 6. Big Winners and Losers under Option 2, Public Teaching Hospitals

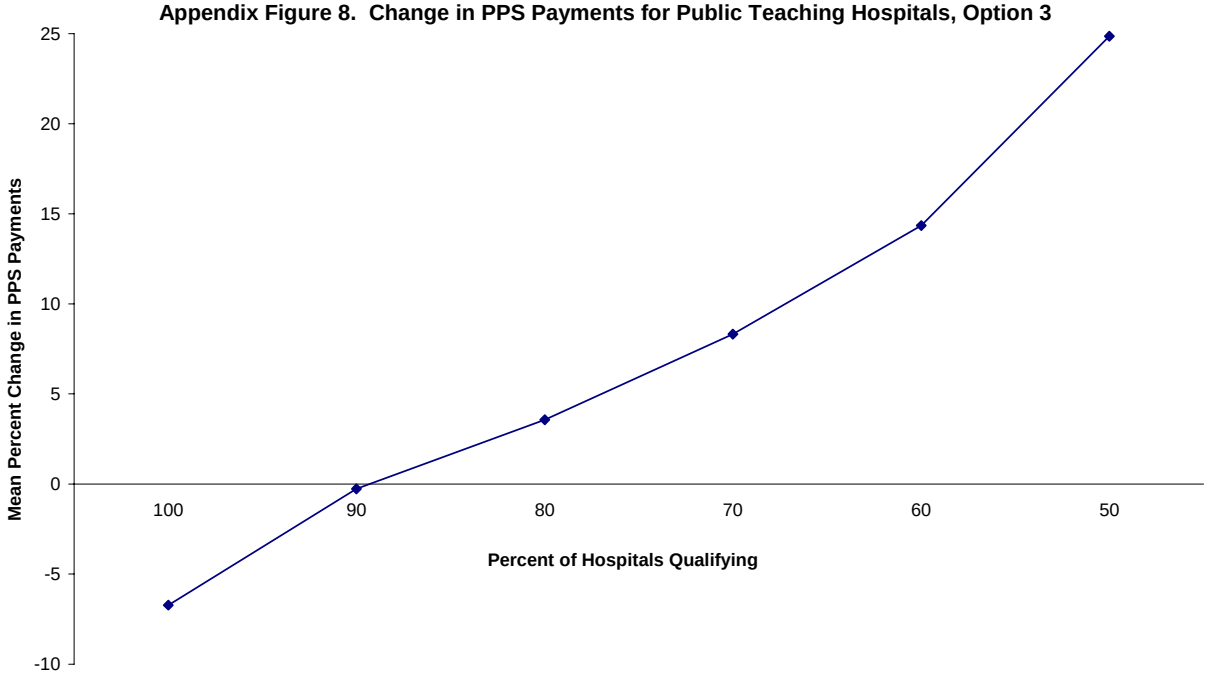


Option 3

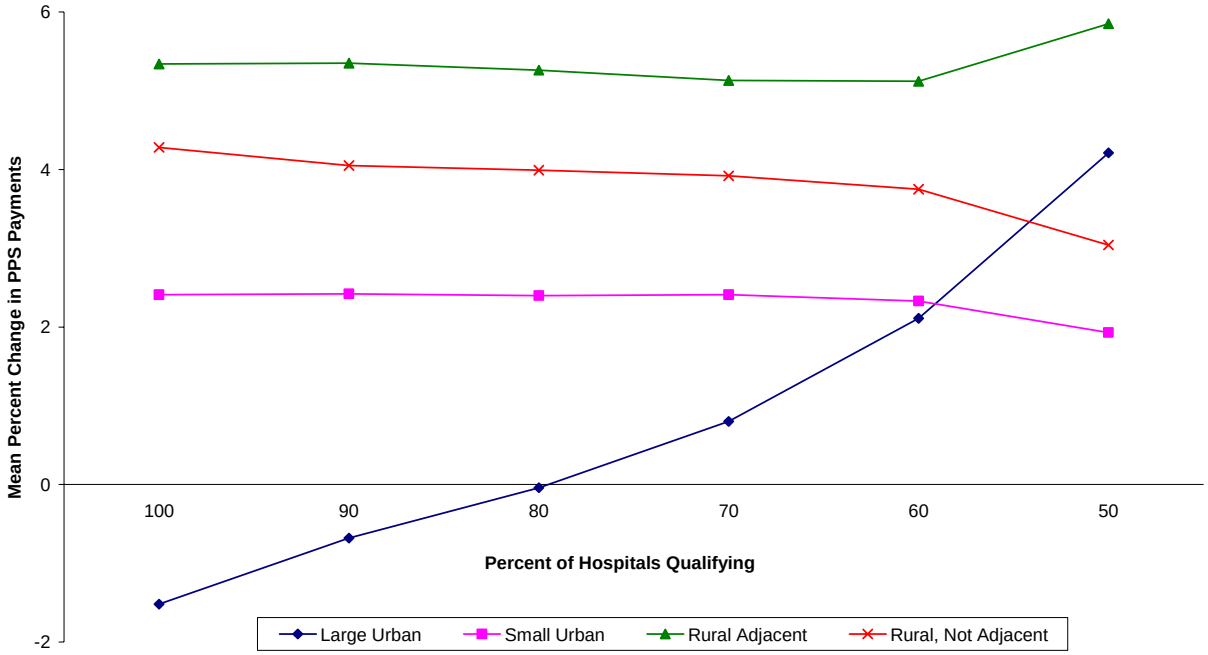
Appendix Figure 7. Change in PPS Payments for Low- and High-Margin Hospitals, Option 3



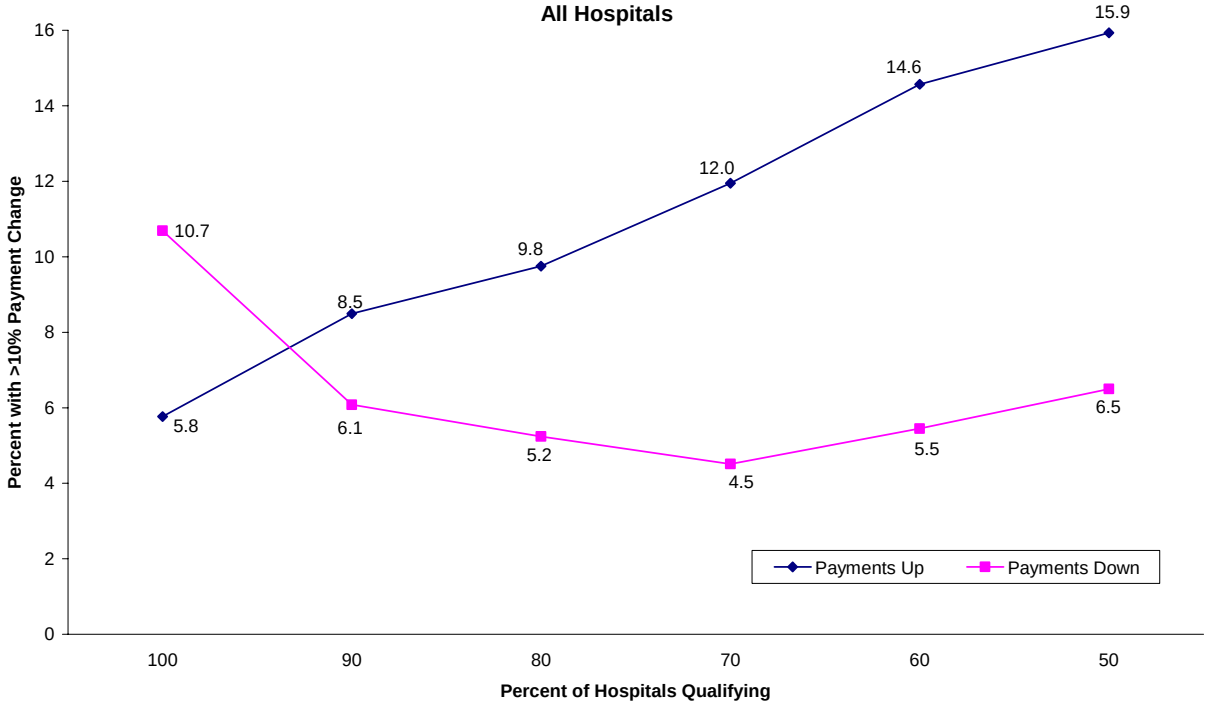
Appendix Figure 8. Change in PPS Payments for Public Teaching Hospitals, Option 3



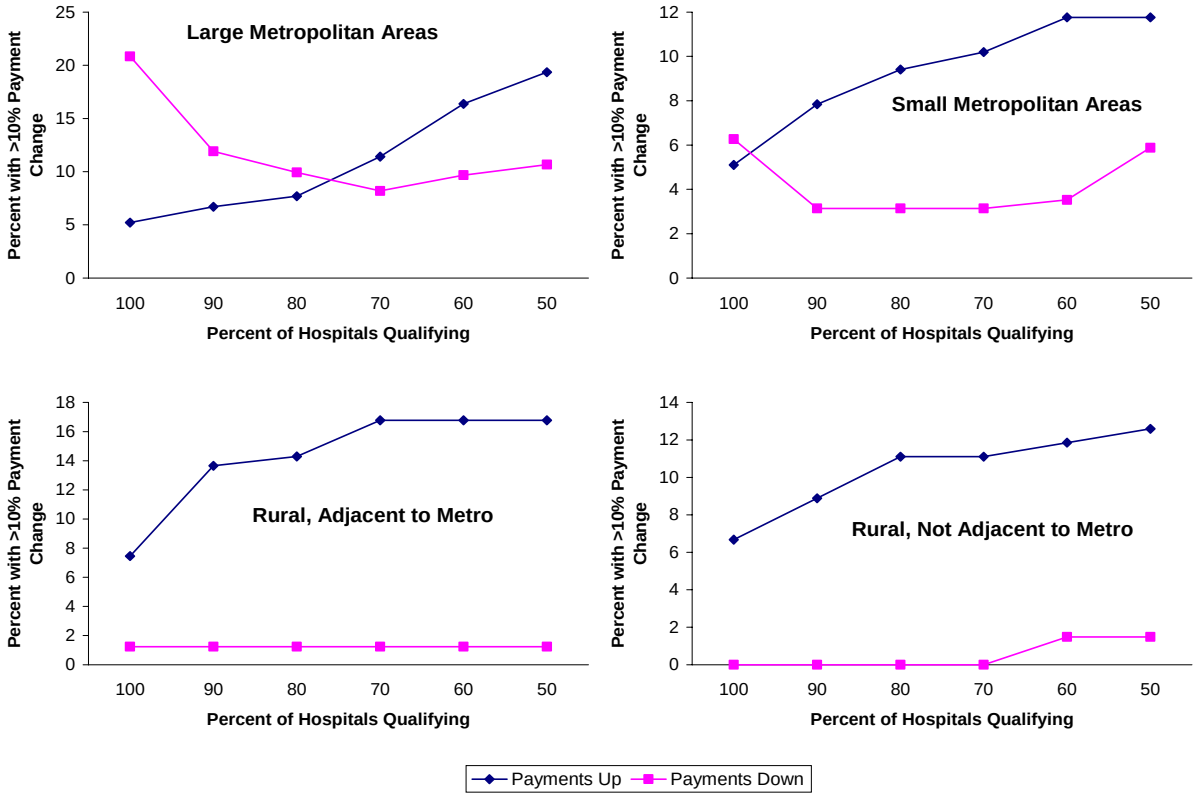
Appendix Figure 9. Change in PPS Payments by Hospital Location, Option 3



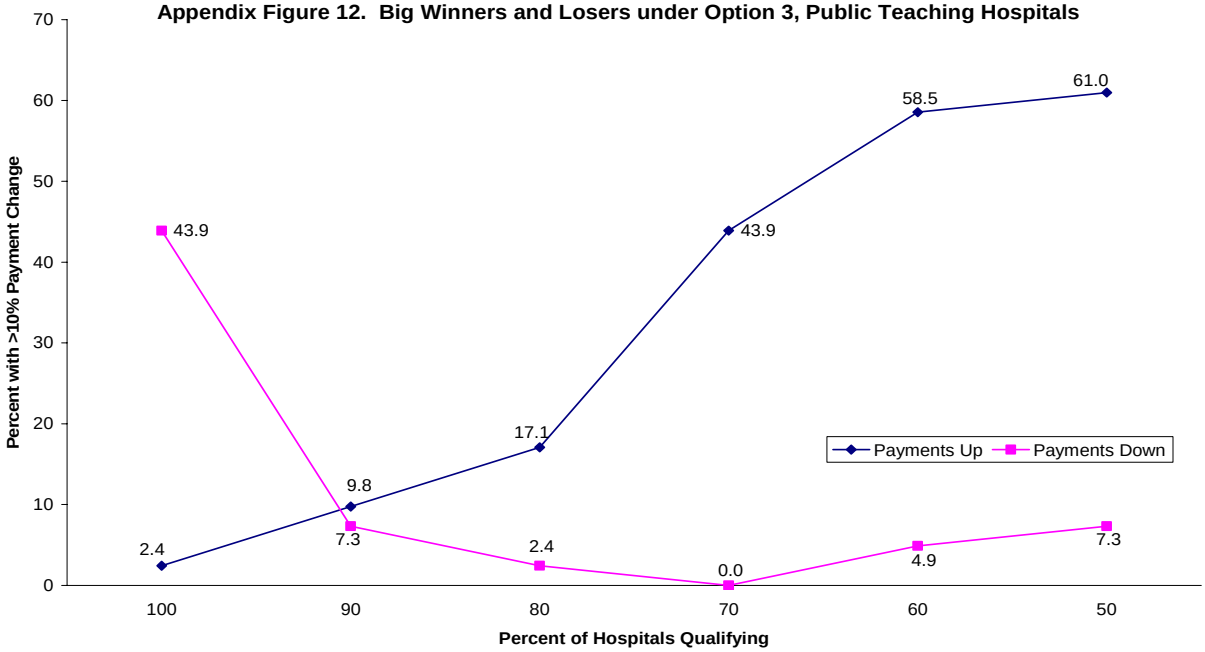
Appendix Figure 10. Big Winners and Losers under Option 3, by Qualifying Threshold, All Hospitals



Appendix Figure 11. Big Winners and Losers under Option 3, by Qualifying Threshold and Hospital Location

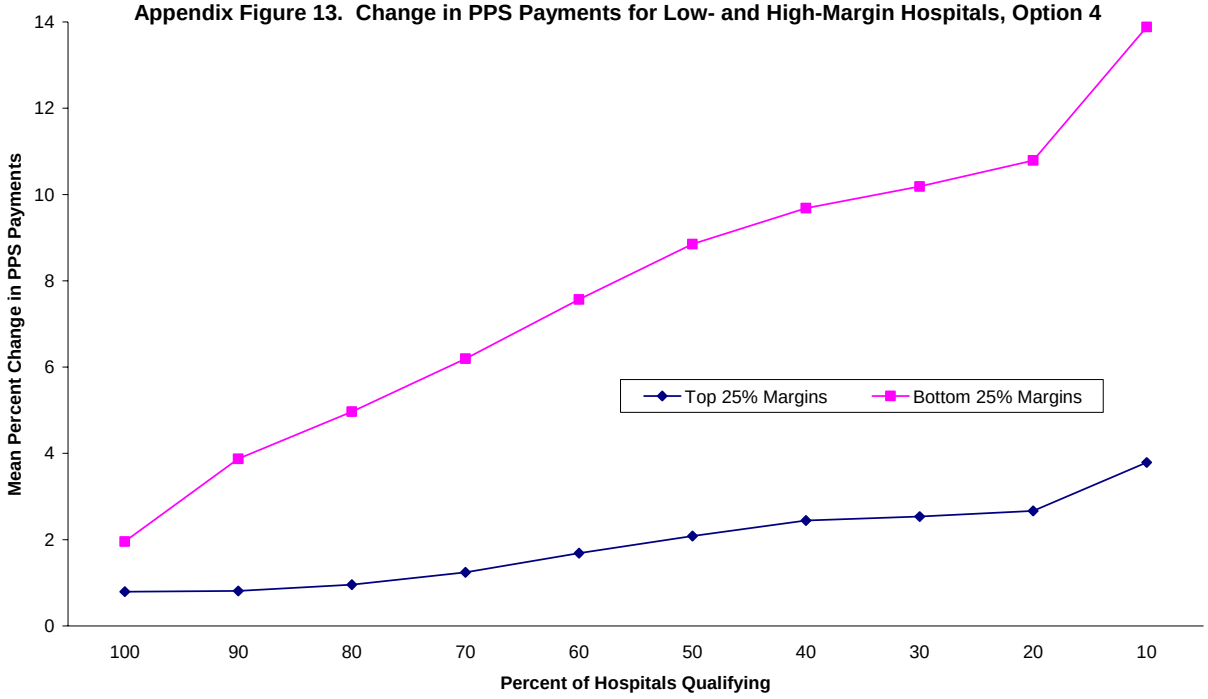


Appendix Figure 12. Big Winners and Losers under Option 3, Public Teaching Hospitals

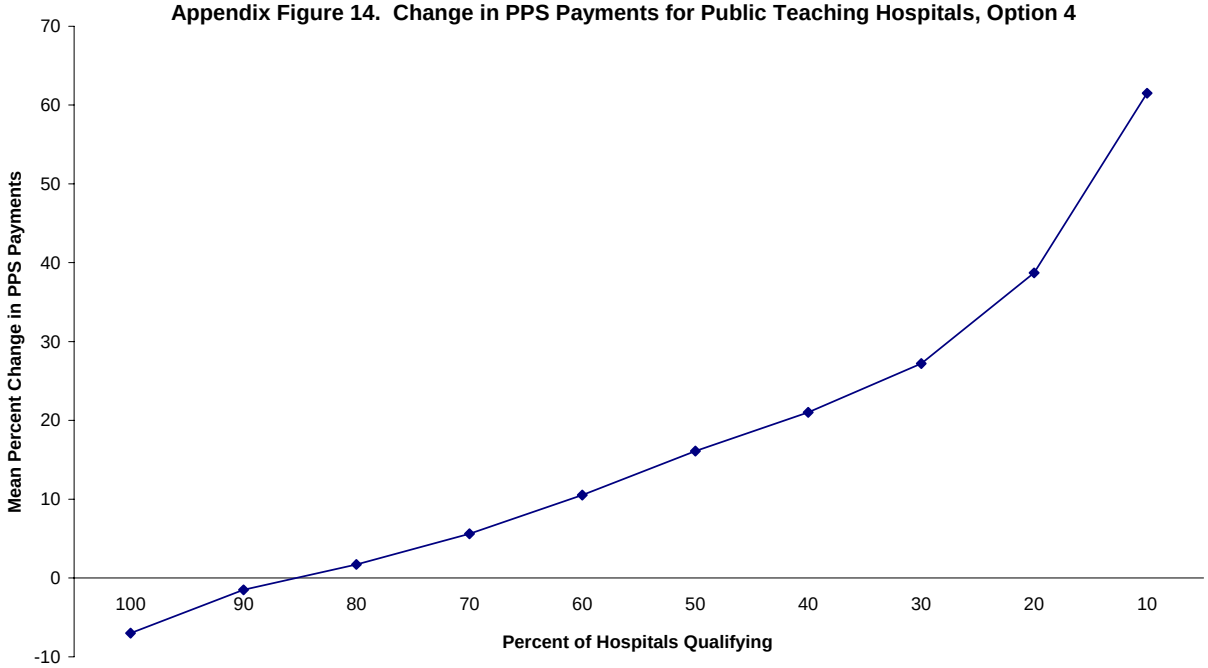


Option 4

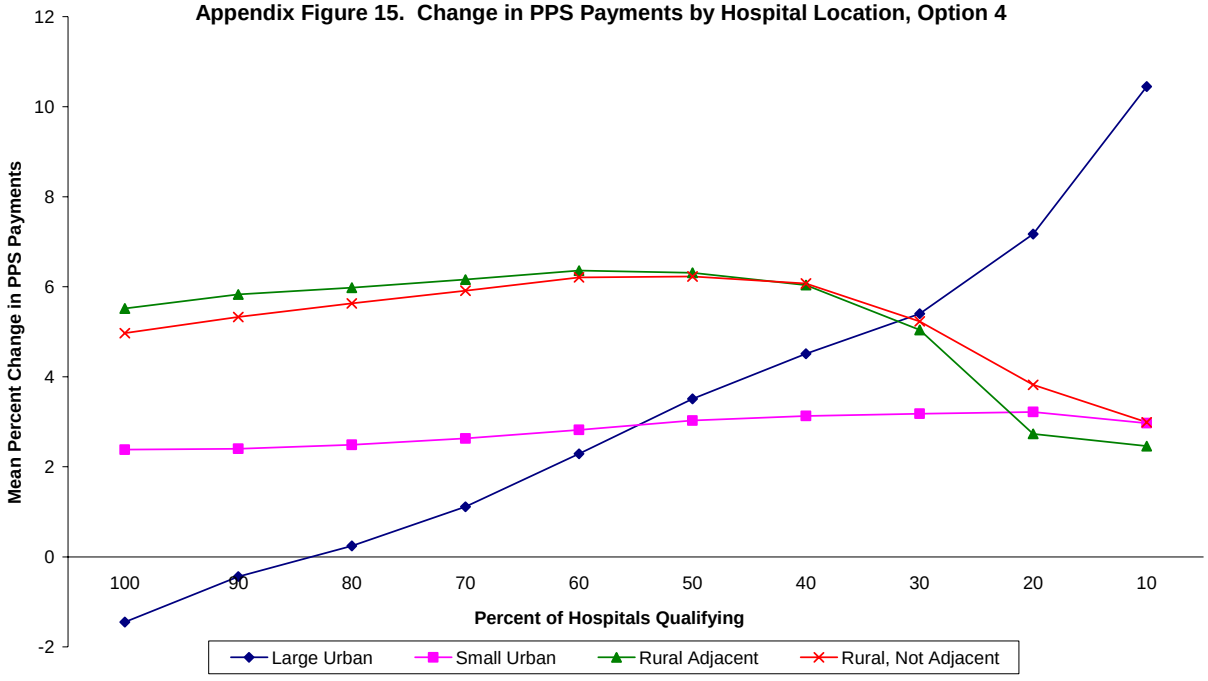
Appendix Figure 13. Change in PPS Payments for Low- and High-Margin Hospitals, Option 4



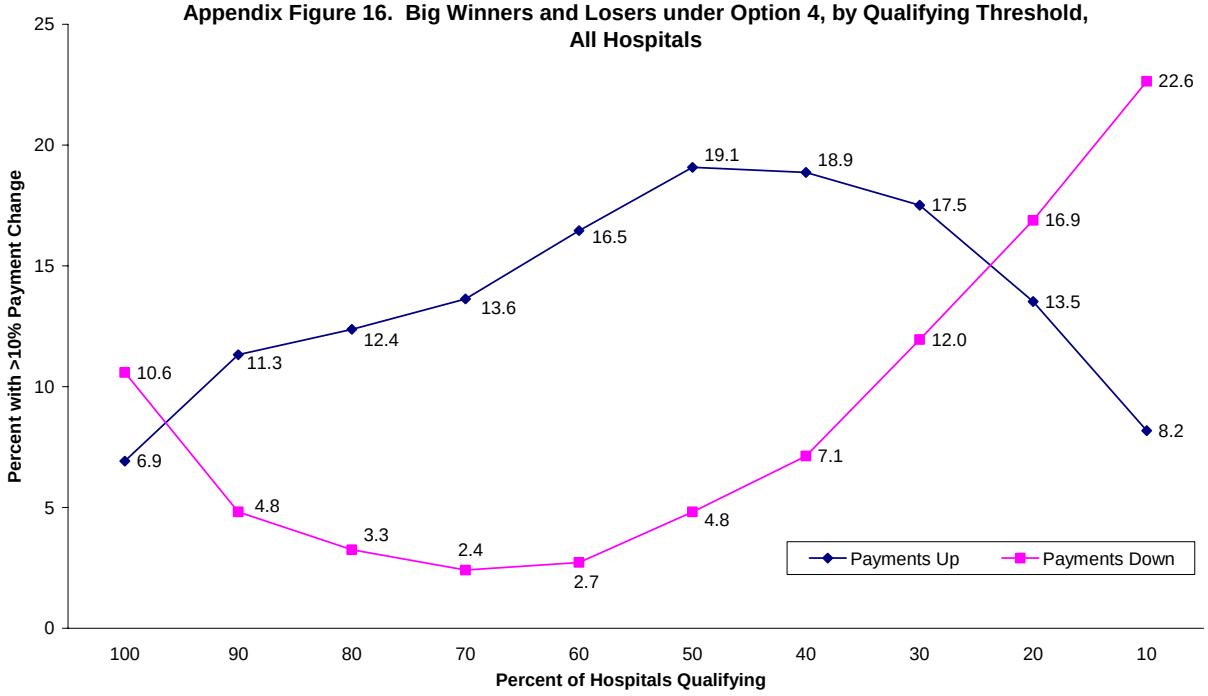
Appendix Figure 14. Change in PPS Payments for Public Teaching Hospitals, Option 4



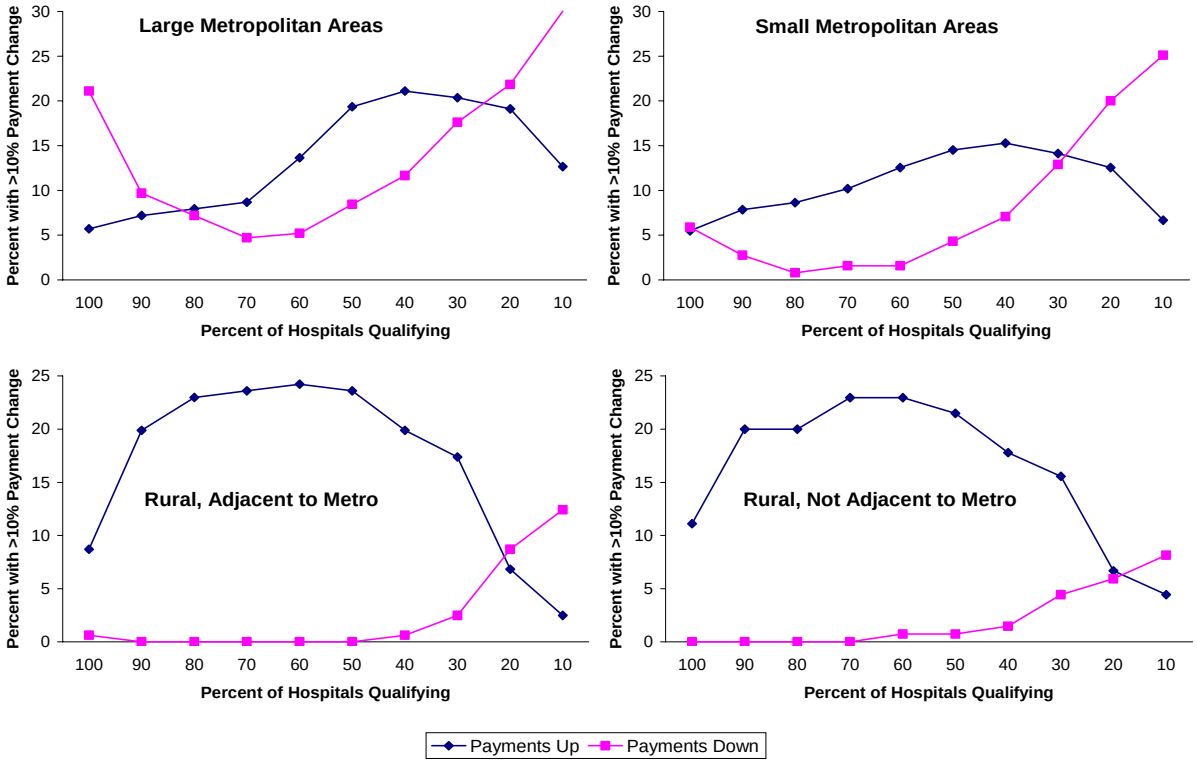
Appendix Figure 15. Change in PPS Payments by Hospital Location, Option 4



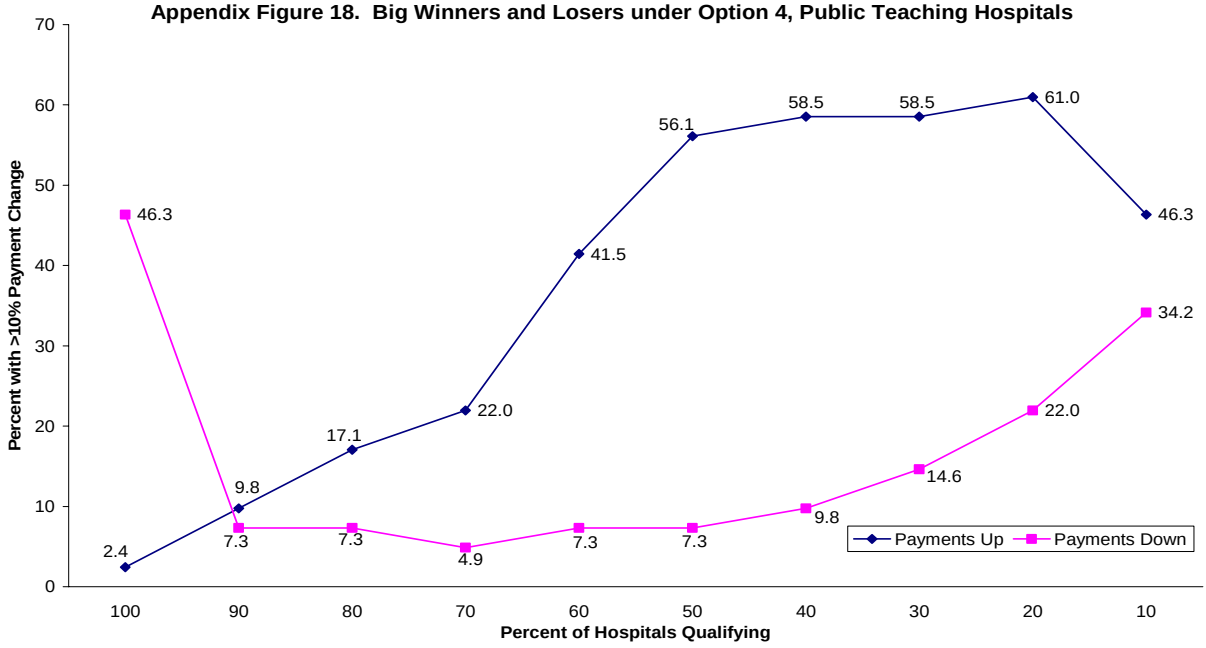
Appendix Figure 16. Big Winners and Losers under Option 4, by Qualifying Threshold, All Hospitals



Appendix Figure 17. Big Winners and Losers under Option 4, by Qualifying Threshold and Hospital Location

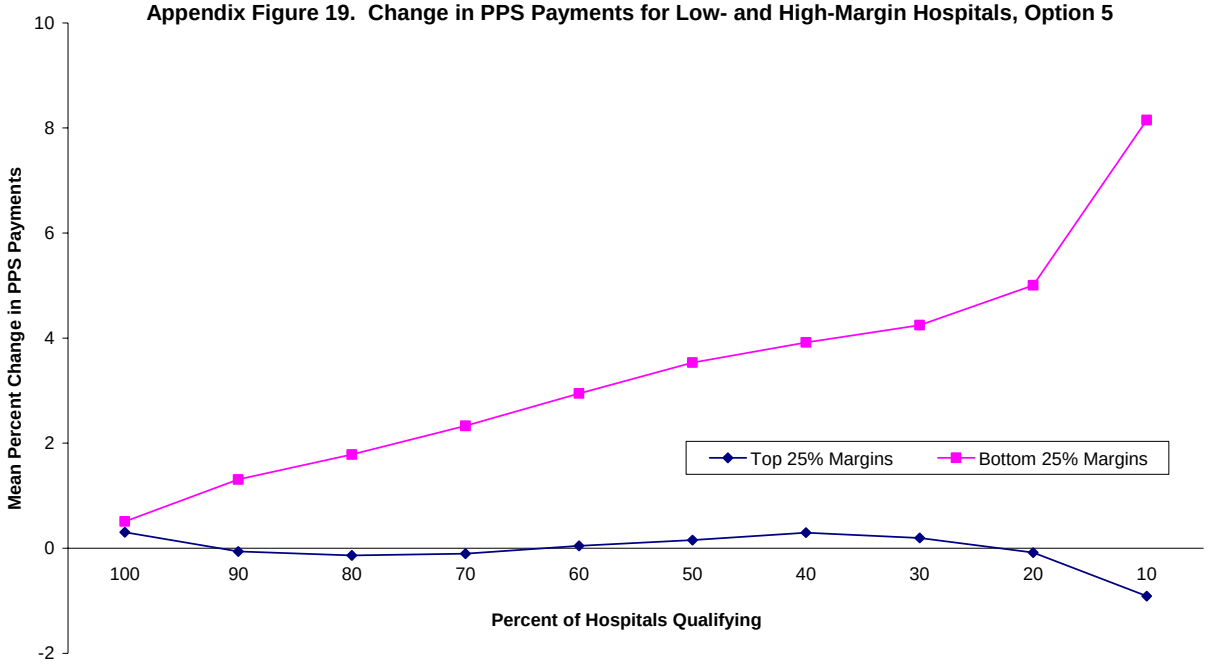


Appendix Figure 18. Big Winners and Losers under Option 4, Public Teaching Hospitals

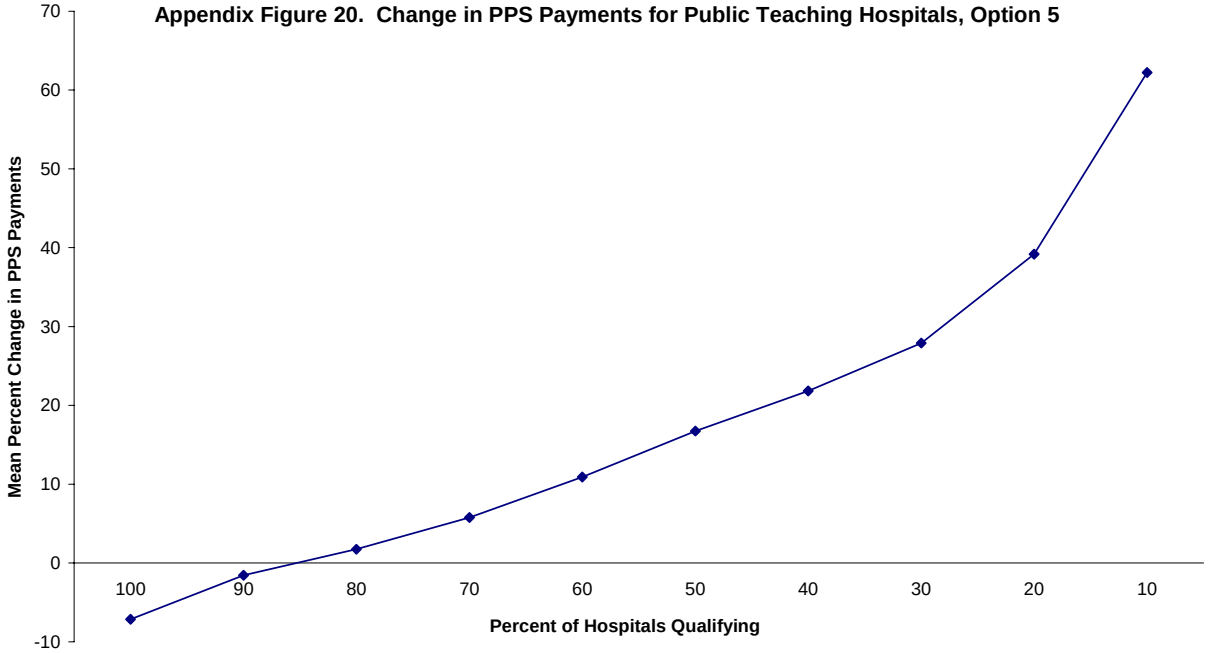


Option 5

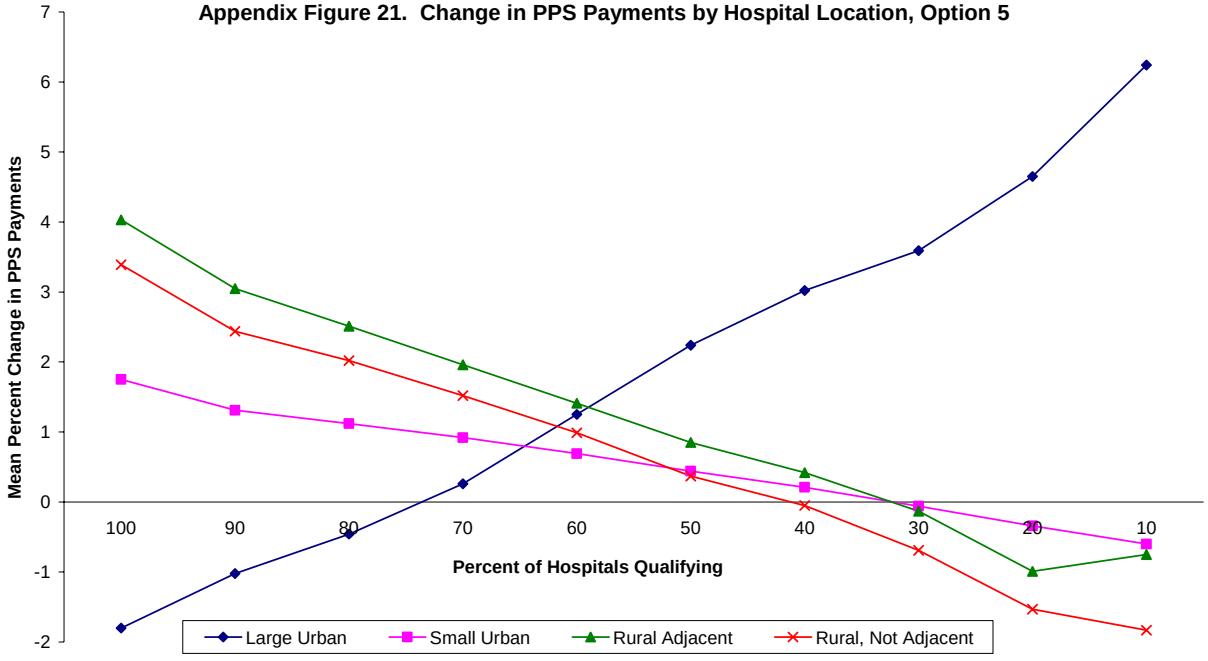
Appendix Figure 19. Change in PPS Payments for Low- and High-Margin Hospitals, Option 5



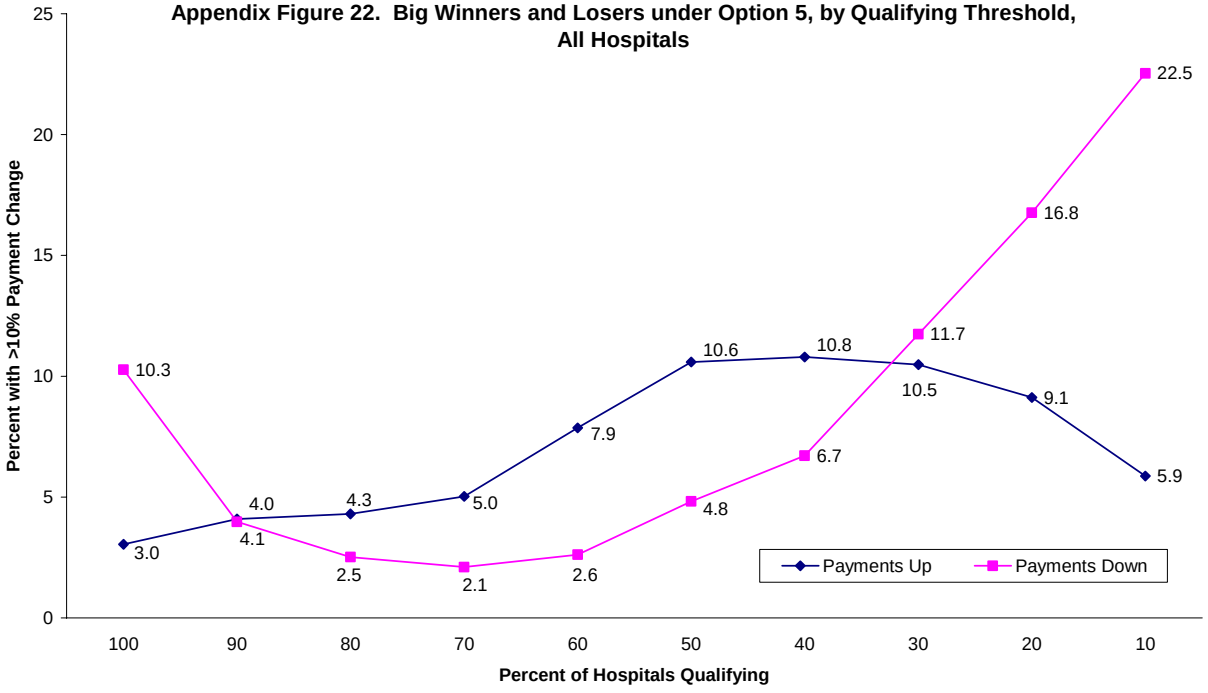
Appendix Figure 20. Change in PPS Payments for Public Teaching Hospitals, Option 5



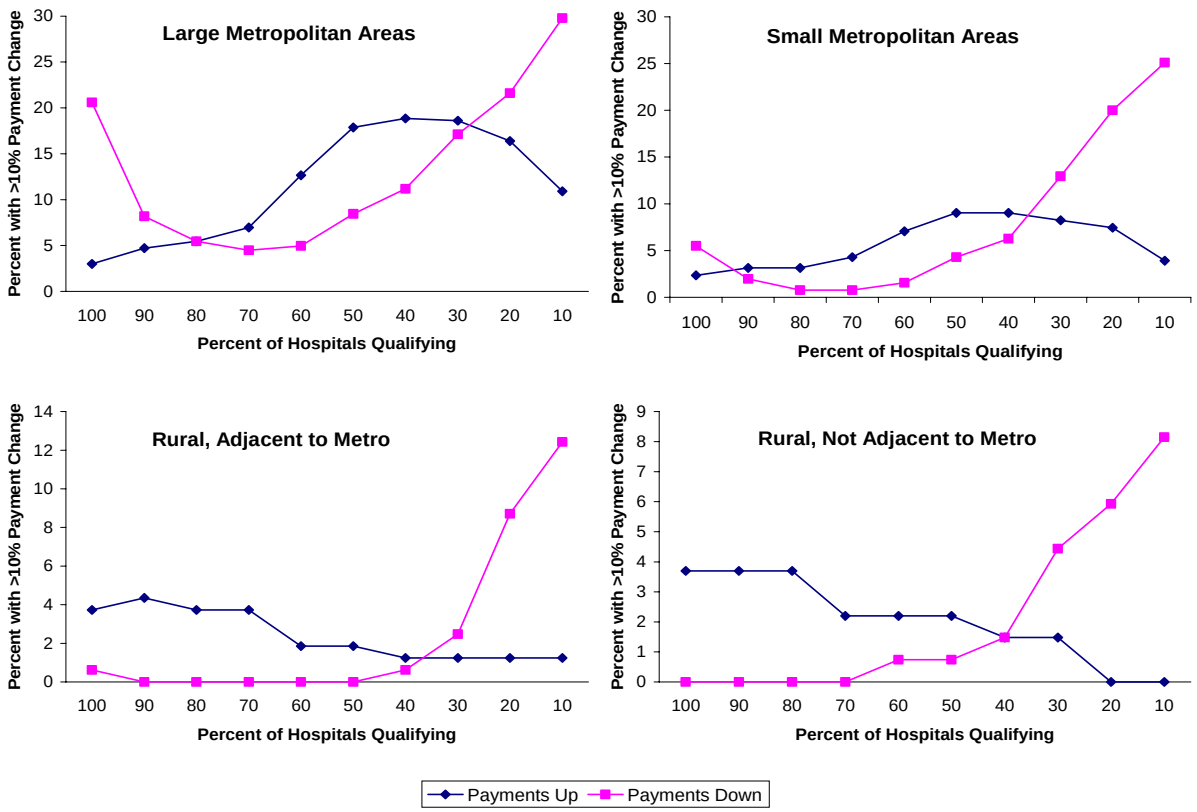
Appendix Figure 21. Change in PPS Payments by Hospital Location, Option 5



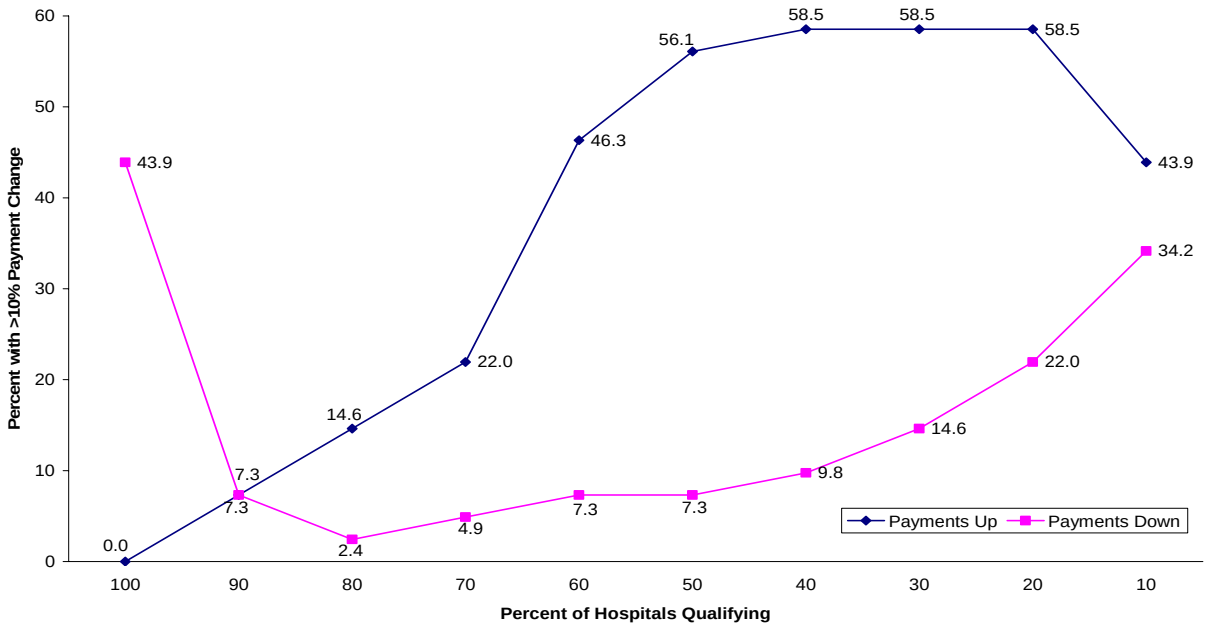
Appendix Figure 22. Big Winners and Losers under Option 5, by Qualifying Threshold, All Hospitals



Appendix Figure 23. Big Winners and Losers under Option 5, by Qualifying Threshold and Hospital Location

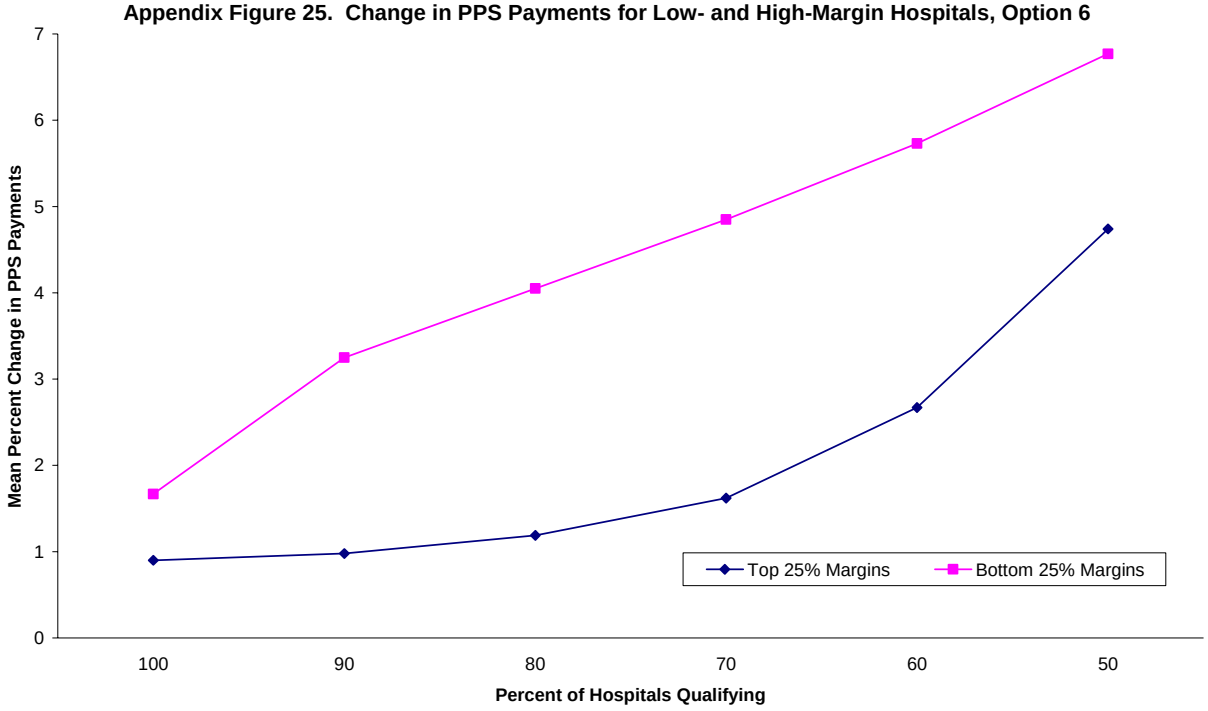


Appendix Figure 24. Big Winners and Losers under Option 5, Public Teaching Hospitals

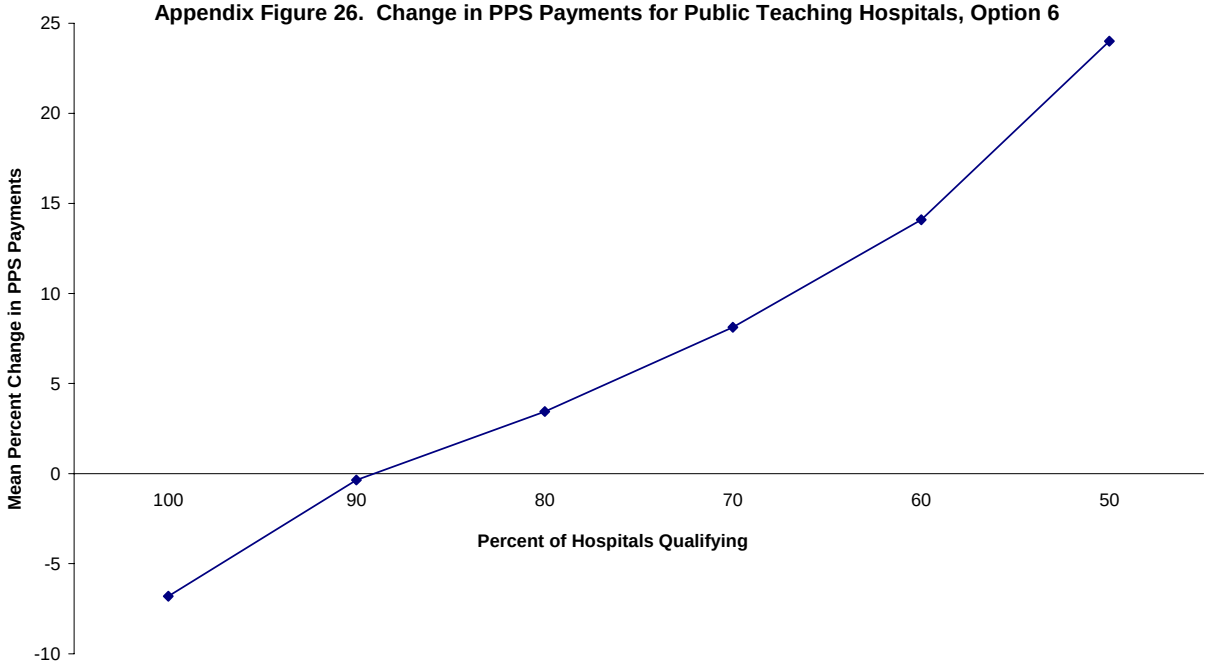


Option 6

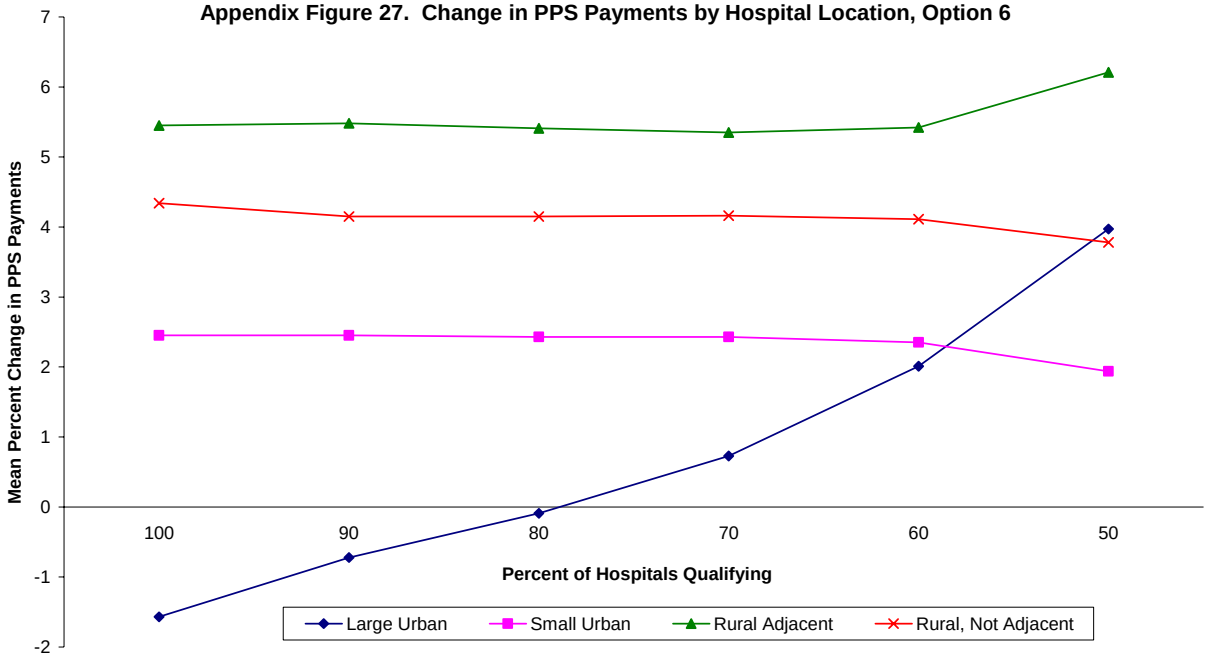
Appendix Figure 25. Change in PPS Payments for Low- and High-Margin Hospitals, Option 6



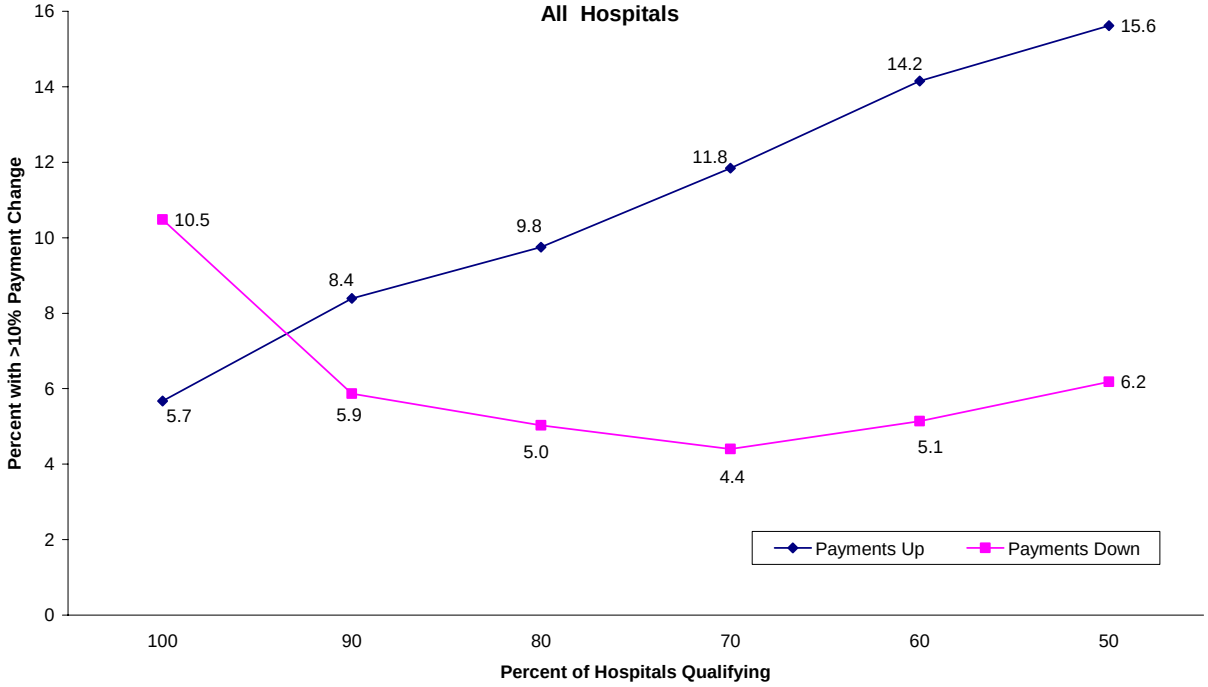
Appendix Figure 26. Change in PPS Payments for Public Teaching Hospitals, Option 6



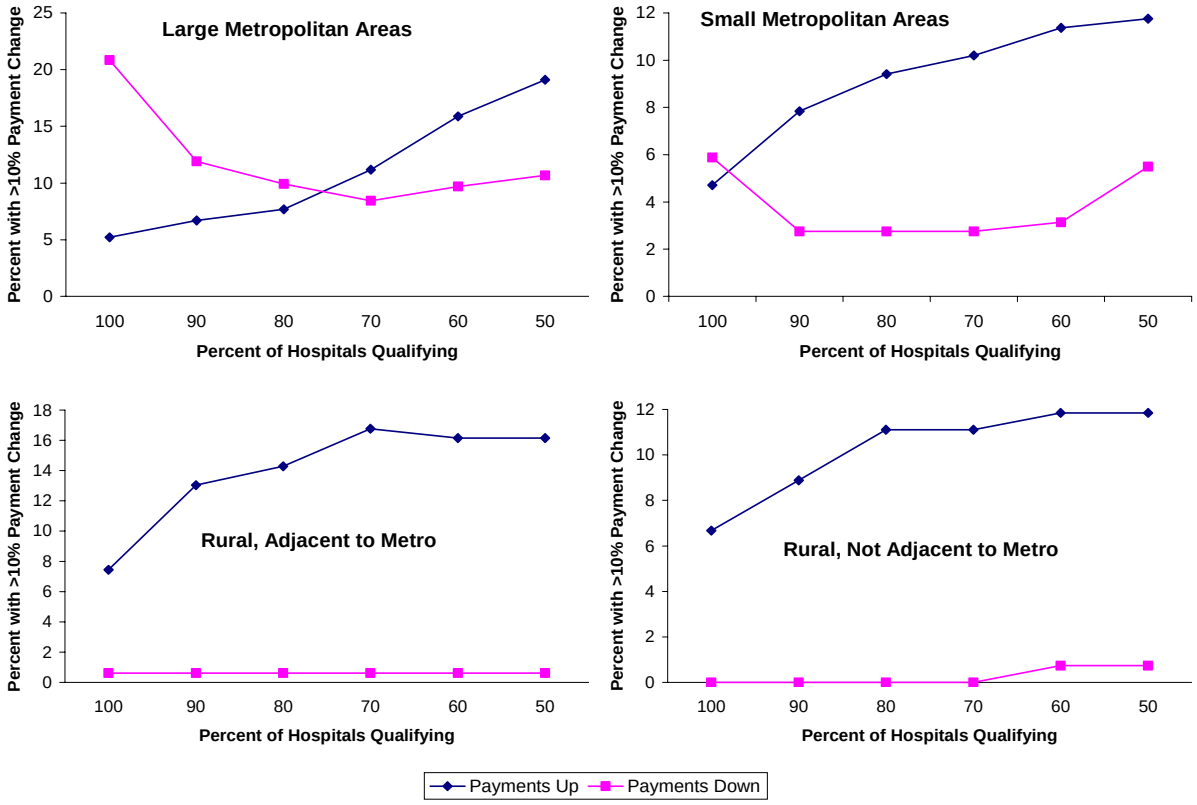
Appendix Figure 27. Change in PPS Payments by Hospital Location, Option 6



Appendix Figure 28. Big Winners and Losers under Option 6, by Qualifying Threshold, All Hospitals



Appendix Figure 29. Big Winners and Losers under Option 6, by Qualifying Threshold and Hospital Location



Appendix Figure 30. Big Winners and Losers under Option 6, Public Teaching Hospitals