Will Value-Based Purchasing Increase Disparities in Care?

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Financial incentives for improving quality and efficiency have gone mainstream in U.S. health care. After years of small-scale pilot projects, demonstrations, and experiments, the Affordable Care Act mandated that Medicare payment to hospitals and physicians must depend, in part, on metrics of quality and efficiency. The first program to do so is Hospital Value-Based Purchasing (HVBP), which began affecting Medicare payments to acute care hospitals in October 2012.

In the first year of HVBP, hospitals received incentives for performance on clinical-process and patient-experience measures. In subsequent years, hospitals will also receive incentives for performance on outcome-based measures, such as 30-day mortality. All hospitals begin with a reduction in their base operating payment, known as a "withhold." The sum of these withholds from all participating hospitals becomes the pool for the incentive payments that are distributed in a given year. On the basis of its performance on quality measures, a hospital receives a payment that is more than, less than, or the same as its withhold.

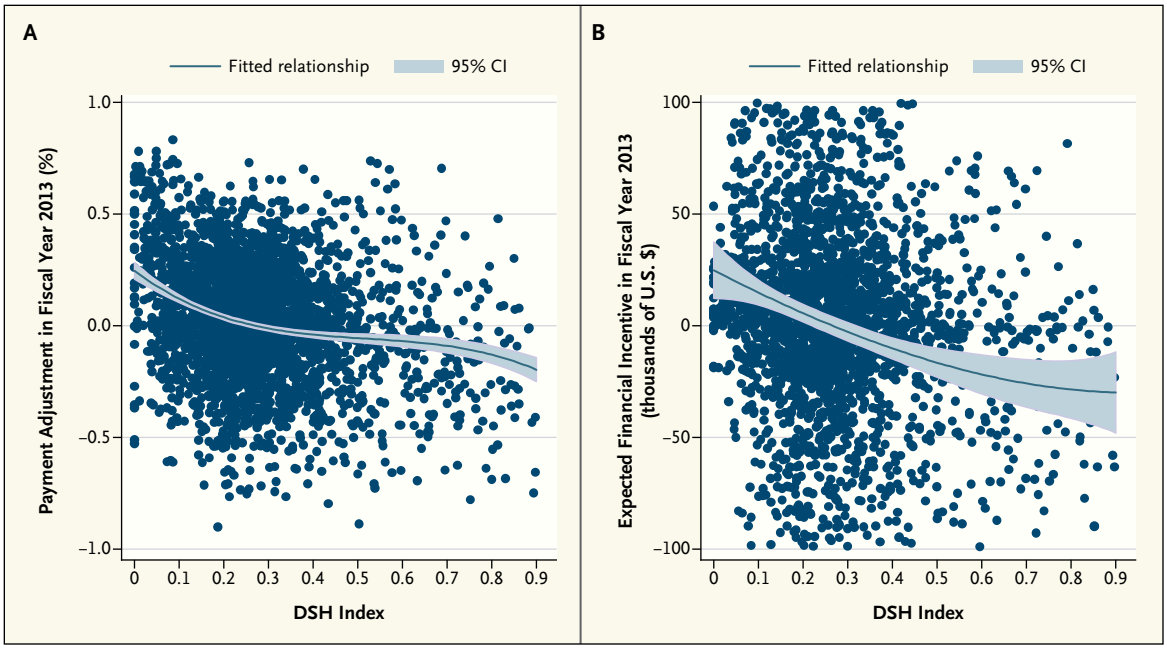
Basic questions remain about whether value-based purchasing will improve quality and efficiency for Medicare. At the same time, there are concerns that such programs could exacerbate disparities in care associated with race and socioeconomic status. Perhaps most compelling of these concerns is that, through the distribution of bonus payments and penalties to providers, these programs could expand the quality gap in the care provided to more affluent and less affluent patients.[1] Lower-performing providers tend to care for poorer patients and have a larger share of patients from racial or ethnic minority groups than do higher-performing providers.[2] If these providers receive lower incentive payments or face payment penalties, they may be less able to fund quality-improvement initiatives — an effect that could, in turn, increase race- and income-related disparities in care.

Numerous researchers have suggested that the solution to this problem may lie in incentive design. Because it is easier for providers with poorer initial performance to improve, value-based purchasing programs may reduce or eliminate disparities in payments by rewarding performance improvement in addition to performance achievement.[1] Incentive payments in HVBP are based on an approach that rewards both. For each measure, hospitals receive points for achievement and improvement. They then receive a summary score that equals the greater of these point values. This method for translating quality achievement and improvement into incentive payments is substantively different from the methods used in previous programs.

I examined incentive payments in the first year of the HVBP program to determine whether hospitals that care for more patients who are disadvantaged received lower payments. The status of hospitals was determined by the Disproportionate Share Hospital (DSH) index[3]; a higher DSH index value indicates that the hospital's patient population is at a greater socioeconomic disadvantage. The two outcomes I considered were the HVBP payment adjustment and the expected financial impact of the program in fiscal year 2013. Payment adjustments can be either positive or negative, depending on hospitals' performance relative to that of other hospitals. The expected financial impact of HVBP is the budgetary effect for each hospital, which equals each hospital's payment adjustment multiplied by the sum of its base Medicare payments for diagnosis-related groups (DRGs) in fiscal year 2011. All data were downloaded from the Centers for Medicare and Medicaid Services (CMS) website.

I used linear regression to estimate the relationship between the DSH index value and both outcomes among 2981 hospitals that were eligible to participate in the first year of HVBP and that had valid data on the DSH index. The analysis did not adjust for hospital characteristics because it focused only on whether hospitals caring for more disadvantaged patients performed worse in HVBP, not whether caring for more disadvantaged patients actually caused hospitals to perform worse in the program.

Hospitals with a higher DSH index value had significantly lower Medicare payment adjustments ($P<0.01$) in the first year of HVBP (see Panel A of the figure), which



Relationship between Hospitals' Disproportionate Share Hospital (DSH) Index and Payments in the First Year of Hospital Value-Based Purchasing.

For the purpose of assessing the expected financial incentive in fiscal year 2013, hospitals' base operating payments for diagnosis-related groups were assumed to have remained the same between fiscal year 2011 and fiscal year 2013; actual payments in the program during fiscal year 2013 may differ. The fitted relationship is based on a cubic polynomial function. To show the fitted relationship in Panel B, the y axis is trimmed to a range of ±$100,000, which excludes approximately 15% of the data points. Data are from the Centers for Medicare and Medicaid Services.

resulted in a significantly more negative expected financial impact (see Panel B). The estimated relationship implies that hospitals at the 5th percentile of the DSH index expect a financial impact of +$18,900 (95% confidence interval [CI], +$11,200 to +$26,600), those at the 25th percentile expect an impact of +$7,600 (95% CI, +$3,600 to +$11,600), those at the 75th percentile expect an impact of −$6,800 (95% CI, −$11,000 to −$2,500), and those at the 95th percentile expect an impact of −$23,300 (95% CI, −$32,700 to −$13,900). Sensitivity analysis using the proportion of discharges that involved Medicaid patients (instead of using the DSH index) yielded the same pattern of results. Supplemental analysis revealed that higher DSH index values were associated with hospitals' receiving lower points for both quality achievement and quality improvement, although the relationship between the DSH index and quality improvement was weak (see the Supplementary Appendix, available with the full text of this article at NEJM.org).

These results show that hospitals caring for more disadvantaged patients did in fact fare worse in the first year of HVBP. Thus, the program has not eliminated disparities in payments by rewarding both quality improvement and quality achievement. Because the financial incentives in the program's first year were relatively small — equal to the net revenue for a handful of high-margin admissions for most hospitals — payment disparities are unlikely to affect hospital resources and disparities in care in the short term.[4] However, the magnitude of the incentives in HVBP will double from 1.0% of Medicare payments for DRGs in fiscal year 2013 to 2.0% by fiscal year 2017. During this time, the criteria for incentive payments will also shift toward performance on outcome measures, which may further hurt hospitals that care for more disadvantaged patients.[2] Such hospitals are also more likely to face penalties from Medicare's Hospital Readmissions Reduction Program.[5] Over time, resource reductions from the additive effects of these programs may cause quality of care to deteriorate among hospitals caring for more disadvantaged patients.

Medicare has options for alleviating the shifting of resources away from hospitals serving more disadvantaged patients. First, the payment criteria in HVBP could be altered to give more weight to quality improvement than to quality achievement. Second, instead of having all acute care hospitals compete against each other, Medicare could create homogeneous competition pools, defined by region, DSH index, hospital size, or other criteria. Hospitals could then compete only against other hospitals in the same competition pool. In that case, HVBP would be budget-neutral within each competition pool, guaranteeing that certain types of hospitals would not be systematically disadvantaged by the program. These two strategies can be criticized because they excuse poorer performance for hospitals with more disadvantaged patients, in effect reinforcing existing disparities in care. This critique must be weighed against the potential harm to vulnerable patients if certain classes of hospitals face resource reductions under the current system. Third, Medicare could increase the technical assistance provided to hospitals with more disadvantaged patients, perhaps by directing Quality Improvement Organizations to focus attention on hospitals with a high DSH index value.

Programs that tie financial incentives to quality and efficiency have the potential to push our health care system to reward value rather than volume. However, a redistribution of resources away from hospitals serving high numbers of disadvantaged patients could increase disparities in care. Going forward, these programs must be carefully monitored and, if necessary, modified to avoid such unintended consequences.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

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Preserving Antibiotics, Rationally

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Antimicrobial resistance is a critical threat to public health. The value of antibiotics for human health is immeasurable, but were one to try to measure, a plausible estimate of the increase in life expectancy attributable to antibiotics might be 2 to 10 years.[1] If we multiply this increase by 300 million Americans and a dollar value of, say, $100,000 per life-year, we arrive at an estimate for the worth of the current stock of antibiotics of $60 trillion to $300 trillion in the United States alone. Unfortunately, this stock is being gradually depleted owing to genetic mutations in bacteria and the selective pressure caused by the flood of antibiotics released into the environment. A total of 51 tons of antibiotics are consumed daily in the United States alone, so the selective pressure in favor of resistant pathogens is strong.

The main use of this invaluable resource is rather disappointing: approximately 80% of antibiotics in the United States are consumed in agriculture and aquaculture (see pie chart). Antibiotics are fed to pigs to speed up growth and increase the efficiency of their digestion (see photo), added to food pellets and dropped to salmon in cages in the seas, sprayed on fruit trees, and even embedded in marine paint to inhibit the formation of barnacles. Such promiscuous use of antibiotics is not surprising: non–pharmaceutical-grade antibiotics are typically priced at approximately $25 per kilogram, and there is little regulation or oversight of their use.

There is a great deal of concern that this profligate distribution of antibiotics around the world is contributing to the development and spread of resistant organisms. Agricultural industry groups, in line with their short-term financial interests, argue that there is no conclusive proof that the antibiotics used in agriculture harm human health. Unfortunately, evidence is mount-