



# Issue Brief

## *Reference Pricing, Consumer Cost-Sharing, and Insurer Spending for Laboratory Tests*

*by James C. Robinson, Christopher M. Whaley, and Timothy T. Brown*



The findings for laboratory tests in this brief derive from a series of studies on the impacts of reference pricing, conducted at the UC Berkeley Center for Health Technology (BCHT). Data for these health insurance studies were obtained from large self-insured employers and employer associations: the California Public Employees Retirement System (CalPERS), Safeway, and the RETA Trust.

All studies compare changes in consumer choice and provider prices before and after implementation of reference pricing, and compare these changes to the choices made by comparable employed groups not subject to reference pricing during the same time period. This research method is referred to as 'difference-in-differences' multivariable statistical analyses. Comparison group data were obtained from health insurance provider Anthem, Inc., and pharmacy benefit manager Envision Rx. Full information on the reference pricing studies can be obtained from the BCHT website, [bcht.berkeley.edu](http://bcht.berkeley.edu).

## **Methods**

In November of 2011, Safeway, a national chain of retail grocery stores and food-processing factories in the U.S., implemented reference pricing for laboratory tests for its self-insured health plan as part of an effort to sensitize employees to the level and variation of prices for the same services within each local market. Unionized employees, governed by collective bargaining contracts negotiated before the development of reference pricing, were excluded.

Additionally, reference pricing was only applied in non-emergency situations, when the patient had the ability to shop among alternative providers. Patients were permitted to use high-priced providers without extra charge if their physicians indicated clinical reasons, or if they did not have reasonable geographic access to a low-priced alternative.

The initiative excluded laboratory tests provided in inpatient hospital, emergency department, urgent care, or other settings where there was no opportunity for price comparison. Tests for active treatment of serious medical conditions including cancer, renal failure, infertility, and severe mental illness, were also excluded.

Safeway established a maximum reimbursable amount for laboratory tests at approximately the 60th percentile of the distribution of 2010 prices. Employees were given access to an online price transparency tool developed by Castlight Health, which presents the allowed charge and the expected patient cost-sharing for different providers.

## ***The problem: price variation***

Prices charged for similar health care services often vary dramatically within and across local communities. This variation results from a combination of low price sensitivity on the part of patients due to generous insurance coverage, and high pricing power by providers, due to increasing market consolidation. Laboratories have traditionally wielded considerable pricing power because, in addition to the reasons above, physician reimbursement has not been linked to the cost of prescribed care. In North Carolina, for example, laboratories charge private insurers between \$5 and \$284 for a basic metabolic panel and between \$8 and \$196 for a lipid panel.

## ***A partial solution: reference pricing***

Employers and insurers have been raising the share of out-of-pocket health care costs that must be paid by patients, in part to offset the ability of hospitals, clinical laboratories, and other providers to raise prices without penalty. Some employers and insurers are adopting reference pricing, an insurance benefit design that encourages employees to favor providers charging low prices for non-emergency “shoppable” services. Reference pricing can pair with price transparency to supplement or substitute for annual deductibles. The long-term goal is to change the incentives facing providers, motivating them to compete based on price and to pursue cost-reducing innovations in the design of their services.

Under reference pricing, the employer or insurer establishes a limit, normally near the median of the distribution of prices in the local market, on what it will contribute towards a particular service. Employees who select a

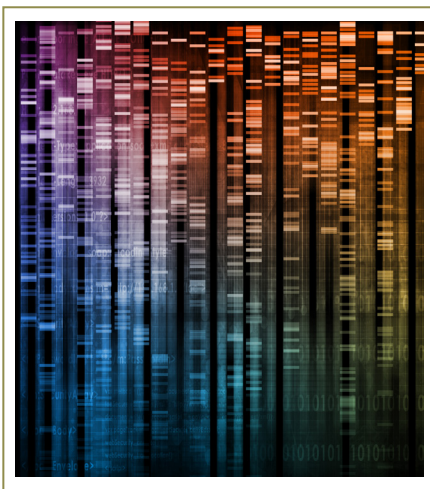
laboratory that charges less than or equal to this maximum amount are subject to the plan's usual out-of-pocket costs but do not pay anything additional for laboratory tests. Employees who select a laboratory that charges more than the reference price are responsible for the entire extra amount, in addition to their regular out-of-pocket costs.

Reference pricing in the United States has led to substantial changes in consumer choices and spending for surgical and diagnostic procedures.

## Findings

### *Change in laboratory choice*

Prior to the implementation of reference pricing, 46 percent of the tests used by Safeway employees were at laboratories that charged more than the subsequently imposed reference limit. By the end of the third year of reference



*DNA Sequencing*

## **Data & Analysis**

National claims data on type, volume, place of service and price of in-vitro diagnostic assays were obtained for employees of Safeway. For comparison, claims data were obtained for enrollees in Anthem Blue Cross Blue Shield who underwent these tests during the same period. The data extended from January 2010 through December 2013.

Patient demographics included age, sex and 3-digit zip code. Patients eligible for Medicare were excluded. The price data included the paid amount, or allowed charge; and separately, the amounts paid by both the employer and patient.

Four endpoints were used in the analysis. The first measured the extent to which Safeway employees selected providers that charged less than or equal to the reference price. The second measured the total price paid, or allowed charge, to the facility. The third endpoint was the amount paid for the test by the patient under cost-sharing obligations. The fourth was the amount paid by Safeway or Anthem for patients not subject to reference pricing.

After adjusting for characteristics of the tests and patients, the association between reference pricing and the four endpoints was analyzed using difference-in-difference multivariable regression analysis, where the change over time for the Safeway treatment group and the Anthem comparison group were computed with respect to each endpoint.

**Figure 1**

**Distribution of Prices Paid by Safeway Across Laboratories in 2010 for the 10 Most Commonly Used Diagnostic Tests**

Laboratory Test	Percentile				
	5th	25th	50th	75th	95th
Basic metabolic panel	\$5.75	\$6.15	\$17.15	\$44.00	\$126.44
General health panel	\$20.58	\$21.88	\$23.88	\$53.66	\$121.86
Comprehensive metabolic panel	\$7.18	\$7.68	\$15.98	\$33.37	\$132.48
Lipid panel	\$8.85	\$9.46	\$11.73	\$30.03	\$74.92
Hepatic function panel	\$5.56	\$5.94	\$11.32	\$24.51	\$85.14
Iron test	\$4.40	\$4.71	\$4.71	\$13.62	\$58.47
Total prostate-specific antigen	\$12.50	\$13.36	\$13.36	\$37.27	\$88.75
Thyroxin free test	\$6.13	\$6.55	\$8.19	\$20.50	\$64.00
Thyroid-stimulating hormone	\$11.42	\$12.20	\$28.53	\$55.87	\$101.70

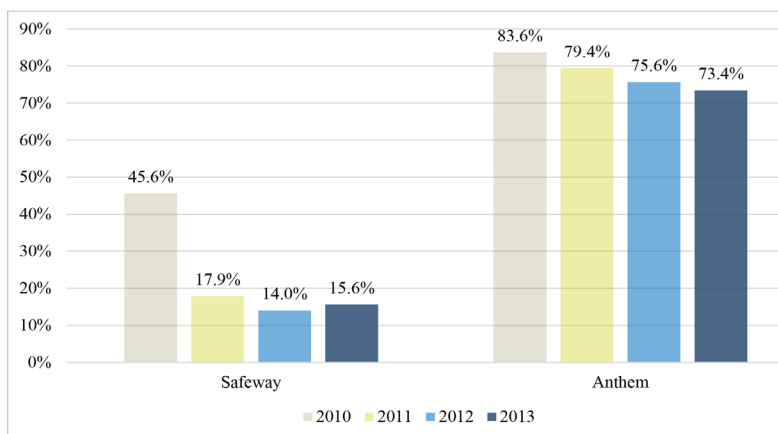
pricing, only 16 percent of employees were still using laboratories that charged above the limit. This decrease cannot be wholly attributed to the implementation of reference pricing because, over the same time period, the number of Anthem enrollees using higher priced laboratories also decreased from 84 percent to 73 percent.

**Price paid per test**

The prices paid by Safeway for diagnostic tests varied significantly prior to reference price implementation. *Table 1* shows the distribution of prices for the 10 most common tests used by Safeway employees. The 95th percentile of price exceeded the 5th percentile price by an average factor of 10. The price for the most common test, the basic metabolic panel, ranged from \$5.75 to \$126.44.

**Table 1**

**Percent of Patients using Higher-priced Laboratories Following Implementation of Reference Pricing in 2010**



Following the implementation of reference pricing in 2011, the average price paid per test by Safeway declined by 31 percent in the first year. This divergence was sustained over the following two years. Average prices remained constant during these three years for Anthem enrollees not subject to reference pricing.

**Out-of-Pocket expenditures by Patients**

In the first year after implementation of reference pricing (2011), patient’s average out-of-pocket payment per test decreased by \$3.58 (34.2%).

The change in patient laboratory choice resulted in lower out-of-pocket payments under the deductible, in addition to avoidance of the supplemental financial responsibility for any amount above the reference price. The reduction in out-of-pocket spending grew to \$4.37 (40.1%

reduction from 2010) in the second year after implementation and to \$4.58 (41.5% reduction from 2010) in the third year.

**Spending by Employer**

Safeway accrued benefits from reference pricing as well. In the first year after implementation (2011), the amount paid by Safeway per test decreased by \$6.82 (30%). Savings persisted into the second year with a \$6.32 (28.3%) reduction and increased in the third year with a \$7.11 (31.1%) reduction. Anthem experienced reductions in test prices of \$0.19 in 2011, \$1.39 in 2012 and \$0.81 in 2013, compared to their 2010 expenditures.

**Overall Savings**

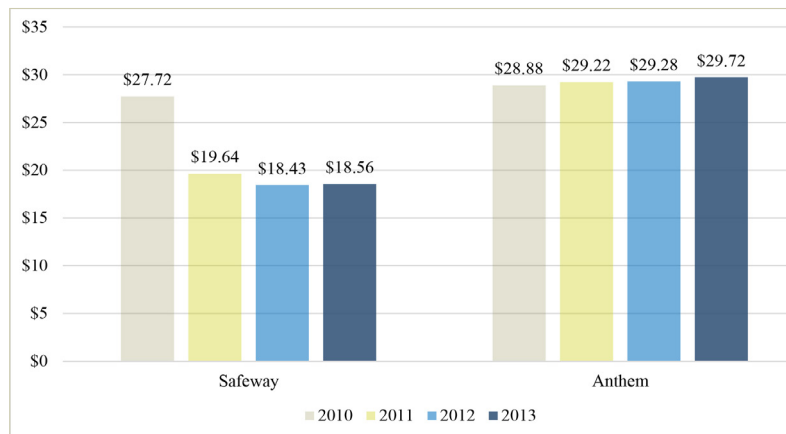
Combined employee and employer savings ranged from \$0.87 million in 2011 to \$0.85 million in 2013, with a cumulative savings of \$2.57 million. This is a 35% reduction in spending on laboratory tests as a result of reference pricing. Both employees and the employer experienced savings. Over the three-year period, Safeway employees saved \$1.05 million while Safeway saved \$1.7 million. The percentage of savings accrued by employees increased from 36.7% in 2011 to 42.6% in 2013.

**Conclusion**

Reference pricing does not address all challenges facing the health care system. It targets prices, not utilization, and neither reduces demand for inappropriate services nor increases adherence to appropriate alternatives. It is limited in scope to acute episodes of care and necessitates patient access to information regarding price and quality. Reference pricing adds to complexity of choice already facing

**Figure 2**

**Average Per-test Price Following Implementation of Reference Pricing in 2010**



**Figure 3**

**Change in Patient Out-of-Pocket Cost per Test After Safeway Implemented Reference Pricing**

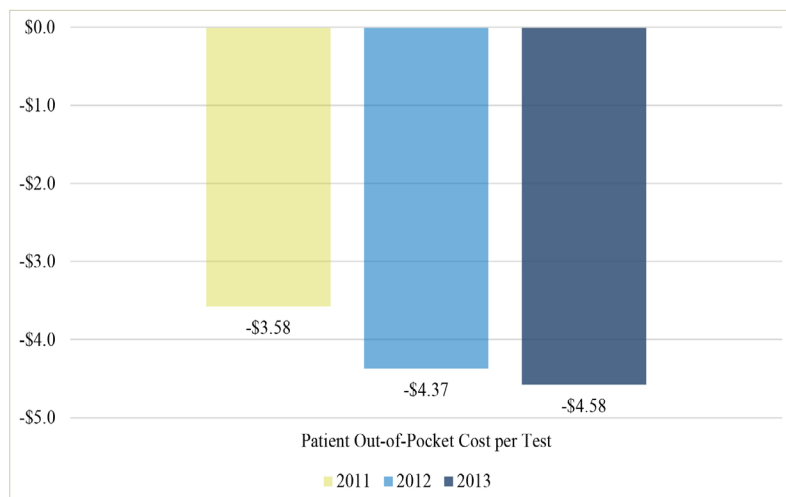
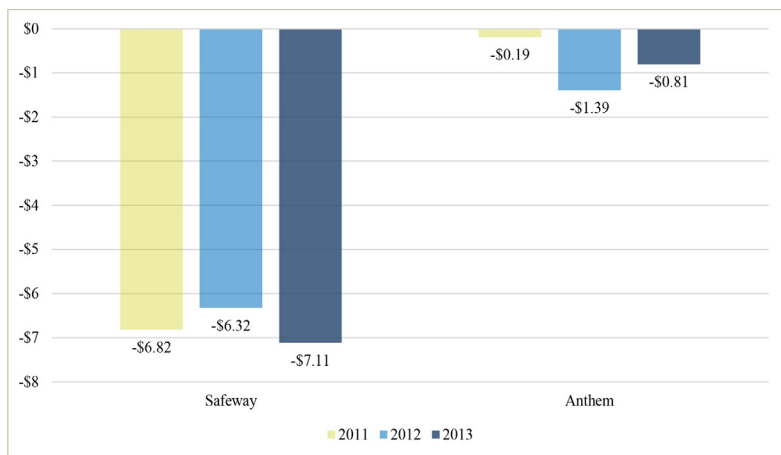


Figure 4

Change in Employer Payment per Test Following Implementation of Reference Pricing



consumers and will only succeed if health care is restructured.

Safeway successfully lowered laboratory spending by double-digit percentages through implementation of reference pricing. Few other purchaser strategies have such potential. Reference pricing can potentially change the way consumers view health care, creating a culture of engagement, cost comparison and informed choices. The experience of shopping for price may stimulate patients to compare providers across all dimensions of performance, and take them a step further on the journey towards value-based health care.

*Robinson JC, Whaley C, Brown TT, Association of Reference Pricing for Diagnostic Laboratory Testing With Changes in Patient Choices, Prices, and Total Spending for Diagnostic Tests. JAMA Intern Med. 2016;176(9):1353-1359. doi:10.1001/jamainternmed.2016.2492*

*Ginsburg, PB. Consumer-Oriented Approaches to Cost Containment, JAMA Intern Med.2016;176(9): 1359-1360.doi:10.1001/jamainternmed.2016.3875*

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