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**Value Based Insurance Design (VBID) Case Study: VBID
Adoption at the University of Michigan**

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Part I: Designing an Insurance System

The Health Care Cake

“Budgetary constraints do not call for timid measures, but for wise actions.” On April 22, 2004, University of Michigan President Mary Sue Coleman used this opening to outline her vision for the school in the face of decreasing financial support from a state in severe budgetary crisis. The University of Michigan had an opportunity, she argued, to identify salient national problems and develop innovative solutions for them. Pressing among these problems was optimizing health care quality without increased cost. President Coleman called for the creation of a “University of Michigan prototype for new approaches to rational and affordable healthcare.”¹

At the time of her announcement, the cost of employee healthcare for University of Michigan employees was increasing at a rate of 10%–12% per year. This was even higher than the 8% national growth rate in health care spending and suggested a concerning trend.^{2,3} President Coleman knew she needed to reverse or at least stabilize the increasing costs of health care at the university, and urgently. At the same time, she perceived a valuable opportunity to test innovative ideas in health care financing, ideas that, if successful, might not only help the University of Michigan in the near term with its fiscal crisis but also serve as a model for other institutions.⁴ President Coleman proposed that it would be possible to cut health care costs while also improving quality—in other words, that the University of Michigan could have its cake and eat it too.⁵ It was a goal as admirable as it was ambitious.

The Guinea Pig

In 2004, as in the present day, health care costs were escalating across both the private and public sectors.⁶ To combat this trend, many organizations had begun to increase the amount patients were required to pay for their health care through co-pays, premiums, and deductibles. The rationale for this shift in cost burden was twofold: it would directly decrease the cost of provided care, since patients had to pay more from their own incomes, and it would make patients more discerning customers by forcing patients to assume greater financial responsibility for their. Costs would thus be contained more successfully as a result of improved patient decision-making.⁷

One popular strategy for lowering costs was the use of a tiered pricing system for medications, whereby patients were charged more for brand-name medications and less for generics. In the short term, this strategy succeeded in lowering costs, but concerns began to emerge that shifting the burden of cost to patients was causing patients to cut back on the use of both frivolous and essential medical care. A highly visible paper published in the *New England Journal of Medicine* reported that after a large employer-sponsored health plan adopted a tiered-payment system, approximately one-fifth of patients in the plan stopped taking their ACE inhibitors or anti-cholesterol statins as the result of a price increase. These patients did not switch medications; rather, they simply stopped taking any medications for their conditions.⁸

It was against this backdrop that Pitney Bowes, a 35,000-employee company, unveiled an innovative new patient-payment approach, just a few months after President Coleman’s

address. Like the University of Michigan, Pitney Bowes was concerned about its increasing health care expenses and had contracted a Boston-based modeling firm, Medical Scientists Inc., to determine the causative factors driving this increase. Specifically, Pitney Bowes had divided its employees into two groups: low-cost users averaging \$400–\$700 in annual spending, and high-cost users averaging over \$10,000 in annual spending. The company wanted to understand the predictive factors that transformed a low-cost user into a high-cost one. Perhaps unsurprisingly, the modeling approach revealed that 1) the employees most likely to make such a transition were those with a chronic condition, such as diabetes, and 2) the dramatic increase in health care costs usually represented a catastrophic event, for example, a myocardial infarction.⁹

It was not the chronic conditions themselves, however, that placed patients at highest risk for catastrophic events; rather, it was the poor management of those conditions, defined as the refilling of prescriptions for controller medications less than two-thirds of the time. Motivated by these findings, Pitney Bowes’s corporate medical director Dr. John Mahoney proposed lowering the employee co-pay for diabetes and asthma medications to 10%, regardless of disease status or medication type. Upon making this simple change, Pitney Bowes reported significant savings. Emergency room visits decreased; the company reported a 35% decrease in visits by diabetes patients and 20% among asthma patients over two years after the plan was implemented in 2001. The *Wall Street Journal* quoted Pitney Bowes as stating that the change in drug pricing actually saved the company over one million dollars—an impressive claim, particularly in a time of double-digit increases in health care costs.¹⁰ Although reasonable skepticism regarding such claims is warranted, especially considering that they were generated without rigorous independent verification,^{11,12} the public declaration of enormous savings nonetheless stimulated new discussion in the health care financing community.

The type of approach adopted by Pitney Bowes is now termed Value-Based Insurance Design (VBID) and represents a strategy of using attractive pricing to steer patients toward better health and, in the long term, lower overall health care costs. It was first described in 2001 by Fendrick et al. and is premised on three principles:¹³

- 1) Value is defined as the clinical benefit achieved for the amount of money spent.
- 2) Health care services vary in health benefits yielded.
- 3) The value of a given health care service depends on the individual receiving it.

VBID seeks to incorporate both the health benefit to the patients and the physical cost of the medical intervention when determining insurance payment structures. It seeks to keep the cost barrier low for patients seeking essential medical services. This approach is novel in its focus on pricing as a mechanism to encourage patients to use medicines beneficial to their health instead of solely attempting to dissuade them from using expensive medications.^{14,15}

Adopting VBID

University of Michigan seized upon the new promise of VBID with the intention of using its own health plan as a “testing ground” for the new insurance program. They modified the system implemented at Pitney Bowes by further stratifying the payment scheme by patient disease status. For example, Pitney Bowes had decreased the cost of diabetes and asthma

medications for all members of its health plan. One could argue, however, that lowering the cost of a medication like Metformin would only really be useful for a subset of patients; a patient with diabetes likely would benefit, but a patient with asthma likely would not. With this reasoning, the University of Michigan decided to stratify its patients by disease type and tailor the cost structure of medications according to whether patients had a certain disease.¹⁶

In establishing a pilot program, U. Michigan medical insurance architects wanted to build upon structures within their existing programs to develop the most effective health insurance intervention. Prior to the pilot program, U. Michigan had a diabetes disease management program through its university-affiliated HMO called M-CARE that provided counseling and nutrition support to diabetic individuals. As a result, the designers of the new U. Michigan VBID approach, subsequently named MHealthy: A Focus on Diabetes (FOD), were able to draw upon previously collected datasets to identify individuals within the U. Michigan system with diabetes. The FOD program was designed by Dr. Fendrick, director of the U. Michigan Center for VBID, with collaborative input from disease management and diabetes experts from M-CARE and the U. Michigan medical school. Specifically, diabetic patients were deemed eligible for the FOD pilot if they had filled a prescription for a diabetic hypoglycemic medication in the year previous to trial initiation. This information was acquired from the M-CARE diabetic support database.¹⁷

With the FOD pilot target population identified, the U. Michigan medical insurance administration sent letters to patients within this target population, including information about the planned reduction in co-payment reductions. Before the FOD trial, patients were offered a three-tiered formulary (see Table 1 for details). During the FOD trial, the pricing stratification remained in place, but all tiers experienced a reduction in co-pay price. Furthermore, a variety of drug classes were included in the new reduced co-payment plan, including glycemic agents, antihypertensive agents, lipid-lowering agents, and antidepressants. Prior to the FOD pilot initiation, insulin did not require a co-pay, and this remained unchanged during the trial.¹⁸

| Tier | Medication Classification | Pre-FOD Pricing | FOD Pricing |
|------|---------------------------|-----------------|-------------|
| 1 | Generic | \$7 | \$0 |
| 2 | Preferred Brand | \$14 | \$7 |
| 3 | Non-Preferred Brand | \$21 | \$18 |

As might be imagined, the lowered pricing structure was welcomed by patients. In addition, implementation of this FOD pilot, initiated on July 1, 2006, received commendation in the press and from the Michigan congress.¹⁹ The pilot program was first expected to run for two years, but in 2008, the study was extended for another three years, with outcome measurements on changes in patient adherence and institutional cost expected in 2011.²⁰

Discussion Questions

- The VBID approach adopted by U. Michigan is called “disease-based,” because it adjusts pricing for a subset of patients with a designated condition. By contrast, lowering the costs of specific services to all patients, as done by Pitney Bowes, is called “service-based” VBID.²¹ In what cases would disease-based VBID be more effective than service-based VBID and vice versa?

- What traits are appropriate to use for stratifying patient populations to generate payment plans under VBID? Disease? Gender? Race? BMI?
- Are there cases in which VBID might be viewed as ethically inequitable or legally untenable?

Part II: VBID in Practice

Consider the following patients, all of whom are part of the University of Michigan insurance system.

Patient A

Mrs. Robinson is a 67-year-old diabetic who lives alone. She frequently forgets to take her medications, including her diabetes medication, and when her prescriptions run out, they are almost never refilled on time. Her son takes her for semi-regular checkups, during which her PCP stresses the importance of managing her diabetes. After these visits, Mrs. Robinson does a better job remembering to take her medications, but after a few days she relapses to her old ways. She finds it is simply too difficult to keep track of everything she is supposed to take and when she is supposed to take it.

Patient B

Mrs. Jones is 42 years old and was recently diagnosed with diabetes. She has a family history of diabetes; her grandmother and mother both had the disease. Having served as her mother's primary caretaker, Mrs. Jones appreciates the importance of carefully managing the disease and is prepared to take all the steps required to treat her own diabetes.

Patient C

Mr. Hendricks is a 53-year-old man with diabetes, heart disease, hypertension, and chronic prostatitis. He frequently skips doses of his medications and forgoes refills because the total amount in co-pays is more than what he can afford. When forced to choose between his medications, he usually opts to refill his prescriptions for antibiotics and other medications that are supposed to treat his prostatitis, a source of considerable pain and discomfort.

Patient D

Mr. Wilson is a 59-year-old man with severe, uncontrolled hypertension. He takes several anti-hypertensive agents, included branded agents with high co-pays. He understands the need to manage his hypertension and works hard to pay for all his medications. Still, given the severe and chronic nature of his condition and the considerable expenses presented by his medications, Mr. Wilson wishes the University of Michigan insurance program would offer him a co-pay reduction.

Discussion Questions

For each of the patients described above, consider the following:

- What is the major barrier to improving this patient's health?
- Will a disease-based VBID insurance system such as U. Michigan's FOD program offer incremental health benefits for this patient, as compared to the traditional insurance system? If so, in what ways? If not, why not?
- Ideally, what other features could be added to an insurance system to address this patient's needs?

In addition to Pitney Bowes's service-based program and U. Michigan's disease-based program, two alternative approaches to VBID have been proposed. One is based on condition severity, wherein co-pays are reduced for high-risk patients. The other is based on disease-management participation; copays are reduced only for those patients who

participate in a disease-management program—for example, by attending educational seminars about the disease.^{22,23}

- What are the advantages and disadvantages of these approaches, as compared with service-based or disease-based VBID?
- Would either of these alternative approaches be more suitable for any of the patients above? If so, which ones, and why?

¹ Coleman MS. Future Directions: Shaping the Michigan Difference. University of Michigan, 2004. (Accessed August 1, 2010, at <http://www.umich.edu/pres/speech/archive/2004-04-12-directions.php>.)

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³ Strunk BC, Ginsburg PB, Cookson JP. Tracking Health Care Costs: Declining Growth Trend Pauses in 2004. Health Affairs 2005;DOI 10.1377/hlthaff.W5.286:w5-286-w5-295.

⁴ Jean A. Colman reveals vision for 'U' at Regents' meeting. The Michigan Daily 2004.

⁵ Coleman.

⁶ Strunk.

⁷ Kelly AM, Cronin P, Carlos RC. Introduction to value-based insurance design. J Am Coll Radiol 2008;5:1118-1124.

⁸ Huskamp HA, Deverka PA, Epstein AM, Epstein RS, McGuigan KA, Frank RG. The Effect of Incentive-Based Formularies on Prescription-Drug Utilization and Spending. New England Journal of Medicine 2003;349:2224-2232.

⁹ Fuhrmans V. Leadership (A Special Report): A Radical Prescription. Wall Street Journal, 2004.

¹⁰ Fuhrmans.

¹¹ Fendrick AM, Chernew ME, Levi GW. Value-based insurance design: embracing value over cost alone. Am J Manag Care 2009;15:S277-283.

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¹³ Fendrick A, Smith D, Chernew M, Shaw S. A benefit-based copay for prescription drugs: patient contribution based on total benefits, not drug acquisition cost. American Journal of Managed Care 2001;7:861-867.

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¹⁶ Spaulding A, Fendrick AM, Herman WH, et al. A controlled trial of value-based insurance design – the MHealthy: Focus on Diabetes (FOD) trial. *Implement Sci* 2009;4:19. (Accessed October 30, 2010, at <http://www.pubmedcentral.nih.gov/articlerender.fcgi?tool=pubmed&pubmedid=19351413>)

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Nelson.

²⁰ Dolega, J. U-M diabetes medication program concludes; benefit extended for three years. *The University of Michigan Record*, 2009. (Accessed at http://www.ur.umich.edu/0809/Jan12_09/38.php#more.)

²¹ Chernew ME, Juster IA, Shah M, et al. Evidence that value-based insurance can be effective. *Health Aff (Millwood)* 2010;29:530-536.

²² Fendrick, Chernew, Levi.

²³ Fendrick, Smith, Chernew, Shaw.