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Value-Based Insurance Design at Onex

The operating executives of Health and Benefits for Onex Partners, Megan Jackson Frye, senior principal, and Sam Camens, managing director, faced a problem. Onex was founded in 1984 and in 2020 managed around \$36 billion of capital, primarily invested through private equity funds. Onex's portfolio included 25 operating companies in the United States, representing tens of thousands of employees. Through their roles, Frye and Camens oversaw Onex's nearly \$500 million of spending across health and welfare in the U.S. alone. While each operating company designed and executed its own health benefit programs, Frye and Camens provided them with advice, expertise, and proprietary programs, in council with the operating companies' own benefit brokers/consultants.

Healthcare costs for employees of Onex's portfolio companies were continuing to rise above the consumer price index (CPI), reflecting broader trends across employer-sponsored health insurance in the U.S. (see **Exhibit 1**). Frye and Camens, based in New York, were skeptical of relying on patient cost sharing to change this trend. Instead, they tried a variety of other ideas such as managing unit price through proprietary programs and purchasing coalitions, reducing administrative costs, and curbing unnecessary utilization. However, without constantly finding innovative ways to bend the trend, Frye and Camens worried that their employees' insurance premiums would increase to the point where it would be harder to attract and retain talent.

In 2020, the benefits manager for one of Onex's recently acquired portfolio companies asked Frye and Camens for advice on where to make smart investments in health and benefits programs. She had a broad array of questions about what the portfolio company's health plan should cover, including the possibility that some forms of coverage might actually reduce spending. She was interested in covering wellness programs like smoking cessation. But she was particularly interested in the potential of using value-based insurance design (VBID) principles for pharmacy benefits to encourage employees to take high-value medications; VBID reduced out-of-pocket spending for high-value care, for example, by waiving copays for medications that helped manage chronic diseases like diabetes.¹ Indeed, in the case of diabetes, CVS Health had come out with a recent white paper arguing that eliminating insureds' out-of-pocket costs for diabetes drugs would save insureds money, improve their health, and, by reducing adverse events associated with low adherence, would even save the insurer money.² As Frye and Camens reflected on these programs, they wondered about the evidence for them.

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Employer Provided Health Insurance

In 2018, the U.S. spent \$3.6 trillion of public and private funds—the equivalent of 17.7% of GDP—on healthcare, and healthcare spending was growing faster than the rest of the economy.^{3,4} At \$11,172 per person,⁵ the U.S. spent more per capita on public and private healthcare than other developed nations.⁶ Private businesses accounted for around 20% of such spending.⁷

As of 2019, 57% of the non-elderly population in the U.S. was covered by employer-sponsored health insurance plans.⁸ Most employees were in plans that were partially or fully self-funded by their employers. For such plans, employers hired an outside insurance company to administer claims and negotiate rates with healthcare providers, but employers paid the claims themselves. Employers typically bought so-called “stop-loss insurance” to protect themselves against the risk of extremely large claims from employees. For example, employers could buy a policy covering aggregate claims in excess of some pre-specified threshold they did not expect to exceed.

Employees paid premiums each year in exchange for such coverage. In 2019, the average annual premium for single coverage was \$7,188 and for family coverage was \$20,576.⁹ The latter represented a 22% increase from the family premium in 2014.¹⁰ Employers on average contributed 82% of the premium for single coverage and 70% of family coverage.¹¹ Employees chose from insurance plans that their employers put in front of them. Insurers competed for employer customers by offering broad access networks with provider discounts and employee resources.

At Onex, Camens and Frye urged their operating companies to offer several plans because, as Camens put it, they “believed strongly in choice.” They typically recommended offering a Health Maintenance Organization (HMO) plan (in regions with strong HMO partners), which allowed for delivering richer benefits with narrower provider networks. They also recommended offering a Preferred Provider Organization (PPO) plan, with a broader network, and a high deductible plan. Across all employers (not just Onex), the average premium for PPO plans (\$21,683 for family coverage in 2019) exceeded that for HMO plans (\$20,697 for family coverage in 2019).¹² Camens and Frye typically recommended offering three plans because of a concern that, in practice, employees could become overwhelmed and make mistakes when selecting from large menus of insurance plans, especially without decision support.

If given the opportunity, research in fact suggested that consumers often chose health insurance plans that were guaranteed to cost them more money in comparison to other available options, including those with identical coverage.¹³ One study of employees’ choices between employer-sponsored plans found that many would, for example, spend \$528 more in annual premiums to reduce their deductibles from \$1000 to \$750.¹⁴ In other words, they would pay \$528 to potentially reduce out-of-pocket spending by \$250. In follow-up laboratory experiments, the researchers identified a poor knowledge of concepts like deductibles as a likely culprit for making financially dominated choices.¹⁵

Wrong beliefs and, in particular, a lack of insurance literacy may have played a large role in the errors that people made more broadly. For example, survey research found that 93% of a representative sample of consumers self-reported that they understood the concept of an out-of-pocket maximum—i.e., a maximum amount specified in a coverage policy that a policyholder could be held responsible for paying in a given year.¹⁶ Yet only 55% of consumers actually demonstrated understanding of this concept when given a simple multiple-choice test asking them to indicate which option best described an out-of-pocket maximum.¹⁷ Similarly, for the concepts of deductibles, copays, and coinsurance, significantly more consumers reported understanding concepts than demonstrated an understanding of those concepts. Only 14% of respondents answered questions about all four concepts correctly.¹⁸

At Onex, Frye and Camens felt the responsibility to design plans and contributions in a way that shielded employees from making these sorts of errors. To ensure employees had access to information necessary to make informed decisions, they supported operating companies not just in design, but also through traditional means of communication, healthcare navigators, and technology. In addition, a crucial question Frye and Camens faced was how to limit premium increases. Camens explained:

Employees are very sensitive to the amount that comes out of their paycheck for health insurance. That number cannot be too large, regardless of the richness of benefit design. Every year, you are trying to balance the employee contribution changes with the out-of-pocket costs within the plan design when services are rendered. Ultimately this becomes a philosophical decision of each employer. Do you spread costs across the population in the form of higher contributions or do you lower contributions and have more out-of-pocket costs for those that utilize the benefits? Equity is often in the eye of the beholder!

Increasing Cost Sharing

A major aim of employers, policymakers, and health economists was to figure out ways to “bend the cost curve,” which referred to idea of reducing spending on healthcare by reducing waste and low-value care. One mechanism they focused on was known as cost sharing. Cost sharing attempted to influence health spending and behavior by exposing patients to more of the cost of care. Doing so meant increasing the proportion of care that patients paid for out of pocket via deductibles, copayments, and coinsurance,^a which in turn affected patients’ health and treatment choices. In the decade preceding 2020, patient cost sharing became a more prominent feature of health insurance offerings. From 2012 to 2016, the share of employers offering only high-deductible coverage rose from 7% to 24%.¹⁹ Likewise, from 2009 to 2019, the percentage of individuals enrolled in a plan with a general annual deductible of \$2,000 or more for single coverage steadily rose (see **Exhibit 2**).

In the context of plans at Onex, Frye explained “The idea behind cost sharing is that consumers, when faced with the prospect of paying more of their own money for healthcare services, will spend less by (1) shopping for the best price for comparable services, (2) substituting cheaper care options while maintaining a roughly equivalent quality of care, or (3) foregoing unneeded or unnecessary care. It doesn’t force people to do these things but nudges them to think about what they’re getting for their money.” (See **Exhibit 3** (Panel B) for examples of low-value care cost sharing was meant to discourage.)

In response to changing consumer behavior on the demand side, there was the additional hope that providers of healthcare would find ways to adjust their prices and offerings to compete for consumers, thereby bringing down overall costs.

Consumer Behavior in Light of Cost Sharing

To have any effect on healthcare spending, cost sharing had to affect the healthcare spending behavior of individual consumers. Healthcare research demonstrated that consumers did indeed adjust their healthcare decisions in light of changes to their deductibles, copayments, and coinsurance. In

^a A deductible was an amount defined in an insurance plan that the policyholder paid for care out of pocket before the insurer started to pay for the cost of care. For example, an individual whose plan had a \$1,500 deductible would pay the first \$1,500 of medical care in a calendar year, after which the insurance company would pay for the majority of care. After paying the deductible, policyholders often still paid copayments and coinsurance – either a fixed amount or percentage of a covered health care service – out of pocket. Source: HealthCare.gov glossary, <https://www.healthcare.gov/glossary/>, accessed February 2020.

general, the more consumers were responsible for paying, the less healthcare they consumed.²⁰ Economists called this sensitivity to changes in price the *price elasticity of demand*.

According to conventional economic models, this price elasticity indicated an opportunity to reduce waste. If a person chose not to get some costly treatment because of 10% coinsurance, this signaled she must value the treatment at less than 10% of its cost. So, according to conventional theory, cost sharing reduces such moral hazard: overuse that comes from treatments being subsidized by insurance.

However, the evidence for this theory was mixed. While there was broad consensus among medical professionals on low-value care that consumers tended to overuse (see **Exhibit 3, Panel B**), there was also consensus on high-value care that consumers tended to underuse (see **Exhibit 3, Panel A**). And increased cost sharing seemed to both increase underuse and mitigate overuse (see **Exhibit 4**).²¹

For instance, when a large self-insured firm, with relatively high-wage employees, switched from a health insurance plan under which employees received nearly free healthcare to a high-deductible plan, total firm-wide health spending went down by 11.8% to 13.8%.²² The reductions in spending did not result from employees shopping for better prices for the same healthcare or substituting cheaper options for the same quantity and quality of care. In fact, under the high-deductible plan, employees simply reduced the quantity of healthcare services they consumed, and they were as likely to forego necessary and valuable care as to cut back on unnecessary or wasteful care (e.g., unneeded imaging services). There was also evidence that these consumers did not shop for lower prices when placed in a high-deductible plan, despite having access to a standard price transparency tool. In fact, very few patients even used the tool, and the few who did used it to find more expensive providers.

When consumers reduced demand for necessary or valuable care due to cost sharing, it also sometimes significantly reduced insureds' health or led to greater spending elsewhere in the healthcare system (see **Exhibit 5**). An example of the latter—which economists called an offset effect—was when higher copayments led a patient to forego preventative medication, which in turn resulted in higher hospital costs (usually borne by the insurer) for an otherwise avoidable condition.

One study analyzed the effects of a series of copayment increases that took place from 2000 to 2003 on elderly patients enrolled in California Public Employees Retirement System (CalPERS).²³ Elderly people were modestly sensitive to higher prices for doctors' visits and prescription drug utilization due to cost sharing. Here too, it did not appear that consumers cut back on lower-value medications more than higher-value medicines—medicines for diabetes, asthma, high cholesterol, and hypertension were just as likely to be dropped as symptom-relieving medicines. Many of these patients experienced higher rates of hospital utilization soon after discontinuing their medicines.

These findings posed a challenge for healthcare economists and policymakers who supported high-deductible health plans (HDHPs) and other cost-sharing mechanisms as a means of incentivizing more efficient healthcare spending. Patient cost sharing unambiguously lowered spending, but it did so in ways that did not necessarily accord with greater reductions in low-value care relative to reductions in high-value care. As Frye put it:

The promise of consumerism has not proven itself in the private health insurance market. It is still true today that patients do not have adequate access to quality and cost information that is easily shoppable across the provider community and within their own network. In fact, over the past 10 years, as we have seen HDHPs proliferate, we have seen a reduction in the availability of information necessary for consumers to make informed choices. The reality is that employees are emotional when seeking healthcare, and purchasing decisions are not made in an efficient market manner.

All of this guided Frye and Camens's decision to give employees choices beyond HDHPs. But it also posed a challenge for Frye and Camens's goal of keeping premium increases at bay.

Health & Benefits at Onex

In their jobs running Health and Benefits for Onex Partners, Frye and Camens had to wade through such frameworks and studies through the lens of their own experiences to provide advice on the design of health-benefit plans for employees of Onex's portfolio companies. Frye and Camens had both spent their entire careers in employee benefits. Both of Frye's parents worked for insurance carriers, and Camens came from a long lineage of union members and organizers, who played a key role in shaping his early views of employer responsibility, as well as the delivery and value of employee benefits.

Onex, headquartered in Toronto, Canada, spent nearly \$500 million across health and welfare in the U.S. alone, with around 70% of costs in self-funded programs. Camens and Frye, who worked out of New York, provided advice and proprietary programs to Onex's operating companies charged with designing and executing their own health-benefits plans.

A guiding principle, as Camens explained, was "to create long-term value that will live on without Onex." Proprietary Onex programs were built such that member companies could continue to participate or maintain program terms after leaving Onex, keeping the value driven intact. A second aim was to become a trusted advisor. Frye and Camens did this through organizing symposia, webinars, and engagement with management as well as broker teams.

A key challenge Frye and Camens faced was how to balance the tradeoff between premiums and cost sharing. Overall, Frye and Camens approached this challenge with "a mix of philosophy, plus benchmarking to the premiums, deductibles, and other high-level features of plans offered by similar companies," Frye said. Camens explained:

On the one hand, you could provide a plan design that delivers a high level of benefit, but this requires employees to contribute commensurately high contributions. On the other hand, you could provide a high-deductible health plan with lower employee contributions but higher out-of-pocket costs when care is accessed. The question becomes: do I make everyone, regardless of whether or not they incur healthcare expenses, pay the higher price, or do I put that requirement only on those that use the system in the form of cost share? We compare plan designs and costs against benchmarks on broad features like deductibles and out-of-pocket maximums and try to make sure our businesses are offering competitive programs in the market. Offering a competitive program also means providing employees real choices (e.g., open vs. limited network, first-dollar responsibility vs. copays) and allowing them to make that informed decision.

But this approach left open some questions, such as how to align providers' incentives with employees'. Camens believed a central challenge was to "align interests in the marketplace. Simply said, we would love to be in more risk-bearing contracts with providers that were willing to take on the responsibility of managing outcomes and being rewarded for doing so successfully. This would satisfy the triple aim of lowering costs, improving outcomes, and improving patient experience."

It also left open the question about what to do about benefits that encouraged healthier behavior and might ultimately reduce premiums by reducing employee health costs. For example, early evidence on workplace wellness programs suggested they could ultimately save the employer money by preventing absenteeism and costly health shocks.²⁴ While more recent evidence questioned whether such programs actually save employers money,²⁵ some of Onex's operating companies provided

wellness programs with incentives for certain behavior (e.g., smoking cessation). Camens and Frye viewed such programs as good for “culture building” that reduces employee turnover by increasing employee satisfaction,” Camens said.

Experimenting with Low Copays

More recently, Camens and Frye were starting to hear a lot about an idea called value-based insurance design (VBID) that waived copays for high-value chronic disease medications. They were simultaneously intrigued and skeptical. Their intrigue reflected the potential for greater cost sharing to have a negative impact on adherence and employee health (see, e.g., Exhibits 3, 4, and 5).

A particular focus of proponents of value-based insurance design was to improve low medication adherence rates—patients’ not taking their medicine—which led to poor health outcomes. One estimate suggested that such outcomes included the preventable deaths of more than 100,000 people each year.²⁶ The cost of drugs was one contributing factor to patients’ poor adherence, and one-third of Americans said they either did not fill a prescription or took less of a medication due to out-of-pocket costs.²⁷ Due to differences in coverage, adherence to medication regimens varied even among individuals who had insurance.

In 2011, researchers published the results of a clinical trial that studied patient behavior, health, and spending when insurers eliminated out-of-pocket costs for medications prescribed after a heart attack. The study, called MI FREEE, was designed by independent, academic researchers at the Brigham and Women’s Hospital in Boston, Massachusetts, and funded in part by Aetna, a large U.S. commercial insurer. Researchers at Brigham and Women’s and other institutions analyzed the data independently of Aetna, and MI FREEE was monitored by an independent committee and approved by the institutional review board at Brigham and Women’s. In 2011, the findings were published in the *New England Journal of Medicine*.²⁸ This was one of a growing number of studies that aimed to carefully examine the impact of out-of-pocket costs on patient healthcare spending and health.

Myocardial infarction was the medical term for a heart attack, which occurred when there was a blockage of blood flowing through the heart’s coronary arteries. Patients who had suffered one heart attack were at high risk of suffering a second heart attack or related health problems, known as major vascular events, which could include cardiac arrest and resuscitation, heart failure, peripheral arterial disease, stroke, or unstable angina. Medications such as statins, beta-blockers, angiotensin-converting-enzyme (ACE) inhibitors, or angiotensin-receptor blockers (ARB) were effective at reducing the risk of another major vascular event following a heart attack. However, only 35.9% to 49.0% of patients actually took their medications as prescribed.²⁹ In fact, many patients did not even fill the first prescription after being released from the hospital.

The experiment divided 5,855 eligible patients from 2,980 plan sponsors (i.e., the employer, union, government, or association that sponsors a particular benefits package) into experimental and control groups. The 3,010 patients in the control group received their usual prescription drug coverage (with copayments in the \$12 to \$20 range) via their 1,486 plan sponsors. The experimental group included 2,485 patients with 1,494 plan sponsors, and their coverage was changed to include full coverage for prescription drugs. The full-coverage group “had no cost sharing for any brand-name or generic” prescribed medication, and “[a]ll copayments and coinsurance were waived at the point of care (i.e. the pharmacy), as was any contribution to a patient’s deductible.” The full-coverage patients were informed of these benefits. The two groups were well-balanced. Patients were an average of 54 years old, three-quarters of them were men, and they had the same average copayments.³⁰

The study calculated adherence as a percentage that compared the number of days a patient was prescribed to take medication to the number of days the patient actually possessed the medication. The study also examined the percentage of all patients who had full adherence, meaning they were in possession of their medication at least 80% of the eligible days. If patients did not fill their prescriptions, the study considered them non-adherent.

Clinical outcomes showed that the usual coverage group kept to their prescription regimens 35.9% to 49.0% of the time, depending on the medication, while adherence was four to six percentage points higher in the full-coverage group (see **Exhibit 6**). Some vascular events fell significantly for the full-coverage group (see **Exhibit 7**). Insurer spending on pharmacy costs rose, but overall spending on medical services did not (see **Exhibit 8**). The differences in adherence and out-of-pocket spending were the same, regardless of the patients' previous copayment levels. Although elimination of copayments led to improved adherence, fewer than half of patients were fully adherent, i.e., in possession of their prescription medication for more than 80% of the days in their respective prescribed regimens.

Value-Based Insurance Design at Onex

Camens and Frye were intrigued by evidence and arguments that VBID increases adherence, with potentially large health effects (see **Exhibit 7**) and modest impacts on costs (see **Exhibit 8**). Early proponents of VBID argued that it could lower costs, and hence premiums, by reducing costs through offset effects.³¹ While there was not yet consensus on whether VBID could lower overall costs, evidence suggested that it (modestly) boosted adherence when combined with the sorts of health plans that Onex's companies typically offered. (However, the evidence indicated that combining VBID pharmacy benefits with HDHPs only modestly increased adherence, perhaps because insureds in such plans did not notice that copays on chronic-disease drugs were much lower than copays on other drugs.³²)

Camens noted the limits of VBID, however: "Often, there are many other ways to treat a particular diagnosis. For example, many diabetics can significantly change their status by implementing lifestyle changes. Adherence is just a piece of the patient's journey." In addition, while Frye found the MI FREEE evidence encouraging, she said, "I'd want more data. The length of the study is short relative to the subject matter of heart disease. Do the results remain steady or further improve over time?" To implement a VBID pharmacy benefit, Camens and Frye felt Onex would have to overcome a key challenge: being comfortable that there was a return on investment (ROI) for waiving the cost sharing for a specific benefit. That ROI could come from improvements in short- and long-term health outcomes due to greater adherence.

For example, CVS Health argued in a January 2020 white paper that its "RxZero" plan that waived copays on generic antidiabetic drugs could save everyone money (see **Exhibit 9**).³³ Specifically, the authors argued that the reduction in overall medical costs because of higher adherence and a reduction in demand for branded drugs under RxZero would allow plan sponsors to make up (1) the annual \$244 of average out-of-pocket costs diabetic members paid under cost sharing (assuming they did not use branded medications) plus (2) the additional \$51 increase in costs for diabetes drugs that would come from members' becoming more adherent. Overall, CVS Health said its "Pharmacy Care Economic Model" predicted that RxZero would lower per-diabetic-member annual pharmacy costs from \$1,256 to \$1,225, for example, by reducing hospital visits that would result from low adherence.³⁴ However, Frye and Camens expressed reservations about the white paper's conclusions:

RxZero requires employers to implement CVS's Value Formulary. A formulary change has the potential to have an impact on any and all plan members. For those impacted, it can be quite disruptive, requiring a new prescription and change of drug. Collectively,

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these changes do reduce spending and the Value Formulary is appropriate for some plans, but it is not inherently tied to diabetes medications or improving adherence. The white paper appears to draw upon the savings generated by the Value Formulary implementation and claim them as savings for improved diabetes drug adherence.

Additionally, as Frye put it, they worried that “the short- and long-term impacts of adherence are lost in the normal shuffle of a particular employee base. Any sense in which offset effects lead to greater adherence to save an employer money does not play out in the marketplace because of fragmented payor responsibility.” For example, notwithstanding CVS Health’s white paper claiming that waiving copays on antidiabetic drugs could save everyone money, the authors noted evidence that investment in diabetes disease management provided small gains for insurers over a 10-year horizon, even if it ultimately provided large gains to patients over long horizons.³⁵ In general, Frye felt that under the RxZero plan sponsors were accepting “a large amount of member disruption [due to the implementation of the Value Formulary for all members, not just diabetics] in exchange for a small ROI, without a guarantee, and most likely cost increases.” Moreover, regarding CVS Health, she noted that “incentives and motives when you’re a pharmacy benefit manager, a pharmacy, and a health clinic are super complex. Increasing adherence gives them revenue through rebates, as well as people filling more prescriptions and buying three or four other things when they go to pick up their drugs.”

The ROI could also come from current or potential employees valuing VBID pharmacy benefits more than the required increase in premiums. For example, a 45-year-old employee who did not yet take statins might value knowing that his out-of-pocket spending would not rise by much if he ended up needing to take them. Or a 50-year-old employee already on statins might appreciate that high copays were preventing him from taking the medications as he should—and therefore he might value a, e.g., \$10 reduction in copays by more than \$10. However, such employees were likely the exception, not the rule.

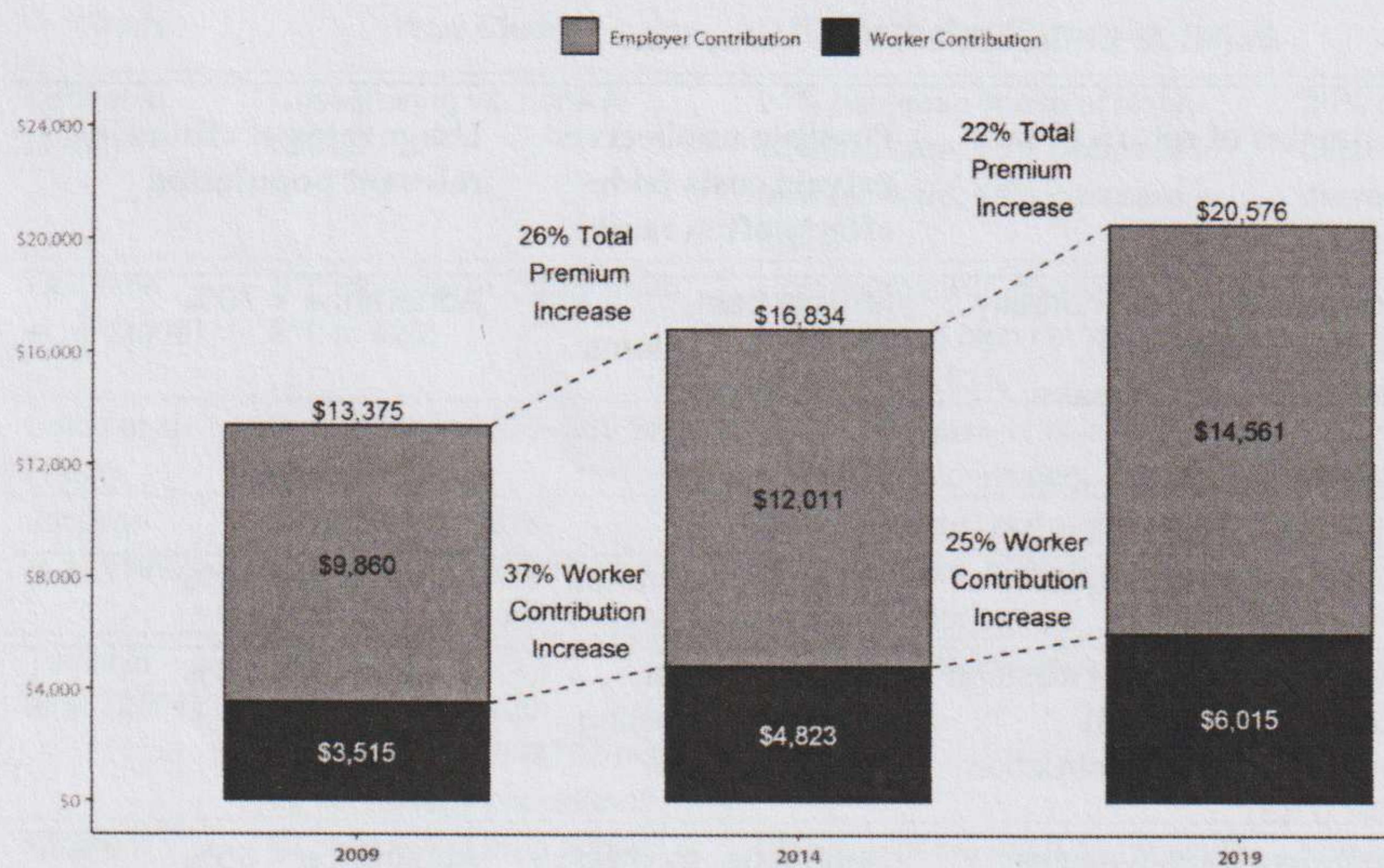
Overall, before recommending VBID pharmacy benefits, Frye and Camens felt they would have to be comfortable with the numbers suggesting there was an ROI. They wondered if Aetna (which was owned by CVS) deployed RxZero and similar VBID benefits in plans that offered a “fully-insured” product and honed in on three central challenges:

1. Integration, specifically with HDHPs.
2. Turnover, specifically whether employees would stay long enough for Onex to see the ROI.
3. Understanding the benefits of waiving the cost sharing, who sponsored relevant studies, and which disease states were being addressed.

Frye and Camens discussed these challenges as they debated the opportunity of VBID in their portfolio companies. As Camens reflected, he could not help but think issues surrounding adherence would feel less consequential in a few years:

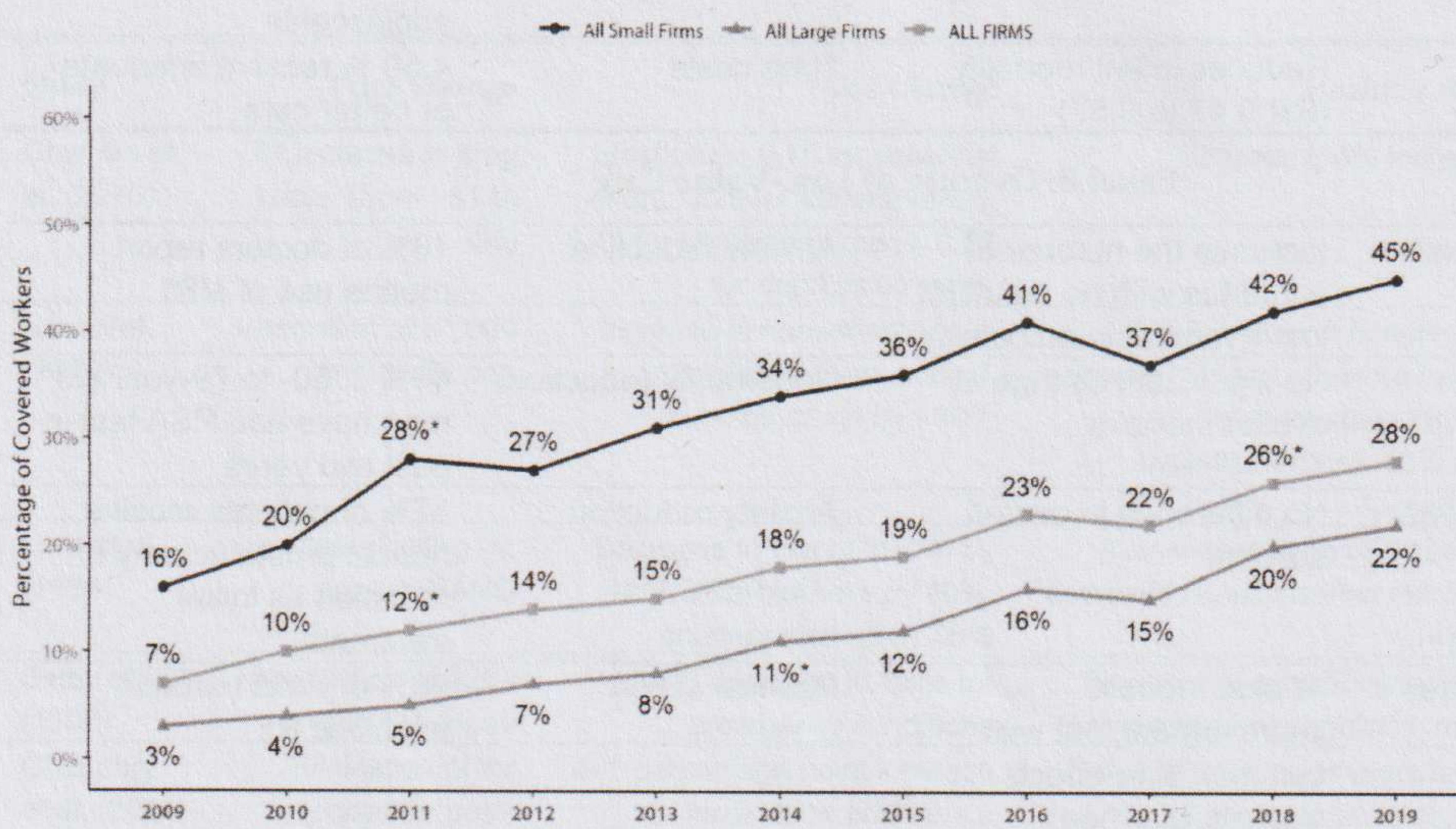
Managing chronic diseases like diabetes is challenging. However, in the next 10 years, we won’t be focusing solely on how to make drugs for such conditions more affordable, but instead on how to cover the multi-million dollar medical interventions (i.e., gene therapies) that will treat the underlying conditions. The exorbitant expense of these interventions will have a detrimental impact on any single employer’s plan. Just one or two multi-million dollar claims in a given plan year could destroy a mid-market employer’s entire budget in that year and subsequent years through reinsurance renewals. In the near future, we will have to discuss how to create high-risk pools to ensure access to these important and life-changing therapies.

Exhibit 1 Average Annual Worker and Employer Premium Contributions and Total Premiums for Family Coverage, 2009, 2014, and 2019



Source: KFF Employer Health Benefits Survey, 2019; Kaiser/HRET Survey of Employer Sponsored Health Benefits, 2009 and 2014 cited in Kaiser Family Foundation, "Employer Health Benefits Survey 2019 Summary of Findings," p.1, Fig. A, <https://bit.ly/34k2OR7>, accessed October 2020.

Exhibit 2 Percentage of Covered Workers Enrolled in a Plan with a General Annual Deductible of \$2,000 or More for Single Coverage, by Firm Size, 2009–2019



Source: KFF Employer Health Benefits Survey, 2018-2019; Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 2009-2017 cited in Kaiser Family Foundation, "Employer Health Benefits Survey 2019 Summary of Findings," p.6, Fig. F, <https://bit.ly/34k2OR7>, accessed October 2020.

Note: Small Firms have 3–199 workers and Large Firms have 200 or more workers. These estimates include workers enrolled in HDHP/SOs and other plan types. Average general annual deductibles are for in-network providers. * indicates estimate is statistically different from estimate for the previous year shown ($p < 0.05$).

Exhibit 3 Examples of Underuse and Overuse of High-Value and Low-Value Care

Panel A: Underuse of High-Value Care			
	Estimates of return to care	Possible unobserved private costs (side-effects often rare)	Usage rates of clinically relevant population
Statins	Reduce all-cause mortality (Relative Risk= .88), cardiovascular disease mortality (RR .81), myocardial infarction or coronary death (RR 0.77)	Muscle pain, digestive problems	Adherence < 70%
Beta-blockers	Reduce mortality by 25% post-heart attack	Fatigue, cold hands	Adherence < 50%
Anti-asthmatics	Reduce hospital admissions (Odds Ratio = 0.58). Improve airflow obstruction (OR 0.43)	Stomach upset, headache, bruising	Adherence < 50%
Anti-diabetics	Decrease cardiovascular mortality (OR 0.74)	Headache, stomach upset	Adherence < 65%
Immunosuppressants for Kidney Transplant	Reduce risk of organ rejection seven-fold	Infections	Adherence < 70%
Recommended Preventive Care	Care of known efficacy including immunizations, disease management, follow-up care post-surgery	Time costs; discomfort of screening; acknowledgment of disease	< 40% of diabetics receive semi-annual blood tests Recommended immunization rates 60% for children, 24% for adolescents
Pre-natal care	Reduces infant mortality (RR 0.47 to 0.57)	Time costs	< 50 % receive adequate or better care

Panel B: Overuse of Low-Value Care			
MRI for low back pain	Increase the number of surgeries with no resultant improvement in outcomes	Anxiety reduction	16% of doctors report routine use of MRI
PSA testing	No significant change in overall mortality	Uncertainty reduction	49% of 50- to 79-year old men have had PSA test in past two years
Prostate cancer surgery	No difference in overall survival	Anxiety reduction	57% of patients receive radical prostatectomy or radiation as initial treatment
Antibiotics for children's ear aches	At best modest improvement, but with common side-effects (rashes, diarrhea)	Positive action	98% of visits result in antibiotic Rx

Source: Compiled by casewriters from multiple sources.³⁶

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Exhibit 4 Demand Responses Often Not Related to Value of Care

Study	Price Change	Higher Value Change in Use	Lower Value Change in Use
Lohr et al. (1986)	Cost-sharing vs. none in RAND	21% decrease in use of highly effective care; 40% decrease in beta blockers, 44% decrease in insulin	26% decrease in less effective care, 6% decrease in hay fever treatment, 40% decrease in cold remedies, 31% decrease in antacids
Goldman et al. (2006)	\$10 increase in copay (from \$10 to \$20)	Compliance with cholesterol meds among high risk decrease from 62% to 53%	Compliance with cholesterol meds among low risk decrease from 42% to 46%; medium decrease from 59% to 49%
Selby et al. (1996)	Introduction of \$25–\$35 ER copay	9.2% decrease in visits for emergency conditions	21% decrease in visits for non-emergency conditions
Johnson et al. (1997)	Increase from 50% coinsurance with \$25 max to 70% insurance with \$30 max	40% decrease in use of antiasthmatics; 61% decrease in thyroid hormones	40% decrease in non-opiate analgesics; 22% decrease in topical anti-inflammatories
Tamblyn et al. (2001)	Introduction of 25% coinsurance, \$100 deductible, \$200–\$750 max for Rx (elderly population)	9.1% decrease in essential drugs	15.1% decrease in non-essential drugs
Chandra et al. (2010)	\$7 increase in drug copay (from ~\$1 to ~\$8)	Elasticity of around 0.15 for acute care and chronic care Rx	Elasticity of around 0.15 for “lifestyle” Rx

Source: Adapted by casewriters from Katherine Baicker, Sendhil Mullainathan, and Joshua Schwartzstein, “Behavioral Hazard in Health Insurance,” *Quarterly Journal of Economics*, vol. 130, no. 4 (December 2015): pp. 1623–1667.

Note: See article for underlying sources.

Exhibit 5 Responses to Price Changes Can Have Large Health Implications

Study	Price Change	Use Change	Health Value (Illustrative Fact)
Chandra et al. (2010)	\$7 increase in drug copay (from ~\$1 to ~\$8)	Elasticities: 0.15 for essential drugs; 0.23 for asthma meds, 0.12 for cholesterol meds, 0.22 for depression meds	Offsetting 6% increase in hospitalization
Hsu et al. (2006)	Imposition of \$1,000 annual Rx cap	Increase in nonadherence to antihypertensives, statins, diabetes drugs by ~30%	13% increase in nonelective hospital use; 3% increase in blood pressure (among hypertensives); 9% increase in high cholesterol (among hyperlipidemics); 16% decrease in glycemic control (among diabetics)
Lohr et al. (1986)	Cost-sharing vs. none in RAND	Decrease in use of insulin by 44%, beta-blockers by 40%, antidepressants by 36%	[Consistent filling of diabetic med prescriptions decrease hospitalization risk from 20–30% down to 14% (Sokol et al. 2005)]
Selby et al. (1996)	Introduction of \$25–\$35 ER copay	9.6% decrease in visits for emergency conditions	Emergency conditions included coronary arrest, heart attack, appendicitis, respiratory failure, etc.
Choudhry et al. (2011)	Elimination of Rx copays for post-heart attack patients	4–6 percentage point increase in medication adherence	Rates of total major vascular events decrease by 1.8 percentage points, heart attacks by 1.1 percentage points

Source: Adapted by casewriters from Katherine Baicker, Sendhil Mullainathan, and Joshua Schwartzstein, “Behavioral Hazard in Health Insurance,” *Quarterly Journal of Economics*, vol. 130, no. 4 (December 2015): pp. 1623–1667.

Note: Health value comes from same study when available. “Illustrative facts” come from other studies. See article for underlying sources.

Exhibit 6 Medication Adherence during Follow-up

Variable	Absolute Adherence				Full Adherence			
	Full Rx Coverage (%)	Usual Rx Coverage (%)	Absolute Difference (95% CI)	P Value	Full Rx Coverage (no./total no. (%)	Usual Rx Coverage (no./total no. (%)	Odds Ratio (95% CI)	P Value
<i>All Patients</i>								
ACE inhibitor or ARB	41.1 ± 39.8	35.9 ± 38.1	5.6 (3.4–7.7)	<0.001	789/2845 (27.7)	689/3010 (22.9)	1.31 (1.14–1.49)	<0.001
Beta-blocker	49.3 ± 37.5	45.0 ± 36.6	4.4 (2.3–6.5)	<0.001	873/2845 (30.7)	758/3010 (25.2)	1.32 (1.16–1.49)	<0.001
Statin	55.1 ± 37.7	49.0 ± 37.3	6.2 (3.9–8.5)	<0.001	1097/2845 (30.7)	950/3010 (31.6)	1.37 (1.20–1.56)	<0.001
All three medication classes	43.9 ± 33.7	38.9 ± 32.7	5.4 (3.6–7.2)	<0.001	344/2845 (12.1)	268/3010 (8.9)	1.41 (1.18–1.67)	<0.001
<i>Patients who filled at least one prescription</i>								
ACE inhibitor or ARB	66.5 ± 29.6	60.8 ± 30.7	5.8 (3.6–8.1)	<0.001	789/1759 (44.9)	689/1775 (38.8)	1.28 (1.10–1.49)	0.002
Beta-blocker	65.0 ± 28.9	61.0 ± 28.9	4.0 (2.1–5.9)	<0.001	873/2159 (40.4)	758/2224 (34.1)	1.31 (1.14–1.50)	<0.001
Statin	70.5 ± 27.0	65.0 ± 28.4	5.5 (3.6–7.5)	<0.001	1097/2223 (49.3)	950/2267 (41.9)	1.36 (1.18–1.56)	<0.001
All three medication classes	67.4 ± 15.5	62.9 ± 26.3	4.5 (2.5–6.4)	<0.001	344/1385 (24.8)	268/1389 (19.3)	1.36 (1.12–1.65)	0.002

Source: Nitesh K. Choudhry, Jerry Avorn, Robert J. Glynn, Elliott M. Antman, Sebastian Schneeweiss, Michele Toscano, Lanny Reisman, Joaquim Fernandes, Claire Spettell, Joy L. Lee, Raisa Levin, Troyen Brennan, and William H. Shrank for the Post-Myocardial Infarction Free Rx Event and Economic Evaluation (MI FREEE) Trial, "Full Coverage for Preventive Medications after Myocardial Infarction," *New England Journal of Medicine*, vol. 365, no. 22 (December 1, 2011), p. 2092, Table 2. <https://www.nejm.org/doi/full/10.1056/nejmsa107913>, accessed November 2020.

Note: Plus-minus values are means ± SD. ACE denotes angiotensin-converting enzyme, and ARB angiotensin-receptor blocker. Absolute adherence was calculated with the use of a medication possession ratio (i.e. the number of days for which patients had a supply of each medication class available divided by the number of days they were eligible for that medication). Ratios were multiplied by 100 to generate absolute adherence percentages. Values are for mean medication possession. Full adherence was defined as having a supply of medications available on at least 80% of days during follow-up. Patients who did not fill a particular prescription after randomization were considered to be nonadherent. Patients who lost eligibility before randomization or who did not fill a prescription after randomization were considered to be nonadherent.

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Exhibit 7 Post-Myocardial Infarction Free Rx Event and Economic Evaluation (MI FREEE) Trial Clinical Outcomes

Outcome	Full Prescription Coverage (N=2,845)		Usual Prescription Coverage (N=3,010)		Hazard Ratio* (95% confidence interval)	P Value
	no.	rate/100 person-year	no.	rate/100 person-year		
Fatal or nonfatal vascular event or revascularization**						
First event	493	17.6	562	18.8	0.93 (0.82–1.04)	0.21
Total events	622	21.5	729	23.3	0.89 (0.80–0.99)	0.03
First fatal or nonfatal vascular event	329	11	405	12.8	0.86 (0.74–0.99)	0.03
Individual components of outcome***						
Myocardial infarction or unstable angina	187	6	236	7.1	0.84 (0.70–1.02)	0.08
Stroke	60	1.8	92	2.6	0.69 (0.50–0.96)	0.03
Congestive heart failure	150	4.8	182	5.4	0.87 (0.70–1.08)	0.21
Revascularization	293	9.8	298	9.1	1.06 (0.90–1.24)	0.51
Death from cardiovascular causes	57	1.7	72	2	0.85 (0.60–1.21)	0.36

Source: Niteesh K. Choudhry, Jerry Avorn, Robert J. Glynn, Elliott M. Antman, Sebastian Schneeweiss, Michele Toscano, Lonny Reisman, Joaquim Fernandes, Claire Spettell, Joy L. Lee, Raisa Levin, Troyen Brennan, and William H. Shrank for the Post-Myocardial Infarction Free Rx Event and Economic Evaluation (MI FREEE) Trial, "Full Coverage for Preventive Medications after Myocardial Infarction," *New England Journal of Medicine*, vol. 365, no. 22 (December 1, 2011): p. 2093, Table 3. <https://www.nejm.org/doi/full/10.1056/nejmsa1107913>, accessed November 2020.

Notes: * Hazard ratios have been adjusted for the cluster and block randomized design.
 ** First events are based on the first occurrence of any of the composite outcome events. Total events include all events in patients who may have had more than one component of the composite outcome. In this analysis, we excluded transfers between institutions, counted only one diagnosis per treatment episode, and counted each specific outcome (e.g., stroke) only one time per patient.
 *** Individual components are based on the first occurrence of these outcomes.

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Exhibit 8 Drug and Nondrug Spending by Patients and Insurers during Follow-up

Outcome	Full Prescription Coverage (N=2845)	Usual Prescription Coverage (N=3010)	Relative Spending (95% CI)	P Value
Total Spending				
<i>Prescription drugs</i>				
Insurer	\$4,847 ± \$15,835	\$3,921 ± \$6,606	1.32 (1.14–1.52)	<0.001
Patient	\$802 ± \$1,061	\$1,164 ± \$1,331	0.70 (0.65–0.75)	<0.001
Combined	\$5,649 ± \$16,384	\$5,085 ± \$7,583	1.17 (1.03–1.32)	0.02
<i>Nondrug spending</i>				
Insurer	\$59,878 ± \$634,988	\$66,076 ± \$617,412	0.90 (0.52–1.58)	0.72
Patient	\$480 ± \$815	\$618 ± \$1,480	0.82 (0.72–0.94)	0.005
Combined	\$60,358 ± \$635,098	\$66,693 ± \$617,756	0.90 (0.52–1.57)	0.72
<i>Total spending</i>				
Insurer	\$64,726 ± \$639,683	\$69,997 ± \$617,650	0.92 (0.55–1.56)	0.77
Patient	\$1,282 ± \$1,549	\$1,781 ± \$2,263	0.74 (0.68–0.80)	<0.001
Combined	\$66,008 ± \$639,970	\$71,778 ± \$618,055	0.89 (0.50–1.56)	0.68
Cardiovascular-specific Spending				
<i>Prescription drugs</i>				
Insurer	\$2,271 ± \$2,408	\$1,822 ± \$2,058	1.31 (1.22–1.41)	<0.001
Patient	\$323 ± \$396	\$665 ± \$721	0.49 (0.46–0.53)	<0.001
Combined	\$2,594 ± \$2,688	\$2,488 ± \$2,659	1.08 (1.01–1.15)	0.02
<i>Nondrug spending</i>				
Insurer	\$15,457 ± \$39,386	\$17,516 ± \$52,895	0.86 (0.74–1.01)	0.06
Patient	\$203 ± \$316	\$235 ± \$349	0.91 (0.82–1.00)	0.05
Combined	\$15,661 ± \$39,509	\$17,750 ± \$52,993	0.86 (0.74–1.01)	0.06
<i>Total spending</i>				
Insurer	\$17,729 ± \$39,658	\$19,338 ± \$53,082	0.90 (0.78–1.04)	0.14
Patient	\$526 ± \$564	\$900 ± \$888	0.60 (0.56–0.64)	<0.001
Combined	\$18,254 ± \$39,839	\$20,238 ± \$53,250	0.89 (0.77–1.02)	0.08

Source: Niteesh K. Choudhry, Jerry Avorn, Robert J. Glynn, Elliott M. Antman, Sebastian Schneeweiss, Michele Toscano, Lonny Reisman, Joaquim Fernandes, Claire Spettell, Joy L. Lee, Raisa Levin, Troyen Brennan, and William H. Shrank for the Post-Myocardial Infarction Free Rx Event and Economic Evaluation (MI FREEE) Trial, "Full Coverage for Preventive Medications after Myocardial Infarction," *New England Journal of Medicine*, vol. 365, no. 22 (December 1, 2011): p. 2095, Table 4. <https://www.nejm.org/doi/full/10.1056/nejmsa1107913>, accessed November 2020.

Exhibit 9 CVS's Calculation that RxZero Can Lower Overall Costs for Payers

Costs Over Time	USD (\$)
Post-Rebate Diabetes PMPY Spread (<i>For a Member Taking Any Anti-Diabetes Medications</i>)	1,256
Cost from Covering Member OOP for all Diabetes Medications	+224
Cost from Increased Medication Adherence	+51
Pharmacy Savings from Change to Value Formulary	-170
Medical Savings from Increased Adherence	-156
Post-Zero OOP Diabetes PMPY Pharmacy Spend	1,225

Source: Adapted by casewriter from Troy Brennan, Sree Chaguturu, Daniel Knecht, "A Prescription for Better Diabetes Management," CVS Health white paper, January 29, 2020, <https://bit.ly/2IVloH3>, accessed October 2020.

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