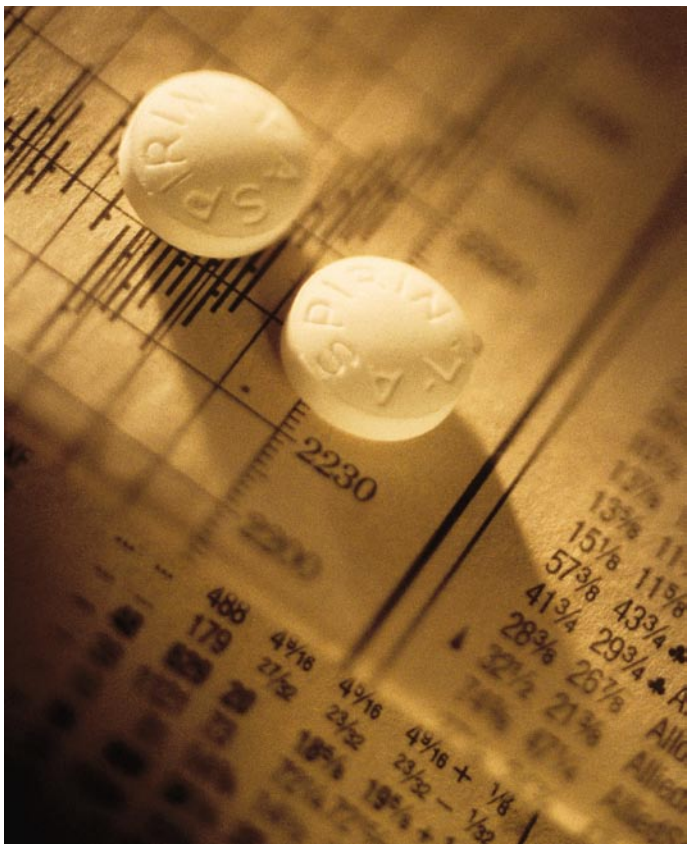
A Broader Reach for Pharmacy Plan Design



Research by the Integrated Benefits Institute

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IBI
INTEGRATED BENEFITS INSTITUTE

Executive Summary

Employers increasingly demand information about how their health and medical interventions affect workforce productivity. Without this information, employers that implement medical cost controls for employees run the risk of discouraging treatment essential to employees' health-related productivity and quality of life. This new study by the Integrated Benefits Institute (IBI) demonstrates the unanticipated consequences in increased short-term disability and lost productivity for rheumatoid arthritis (RA) that can occur when employers increase employee out-of-pocket expenses for prescription medication.

A key conclusion from the research is that data must be integrated across all health-related benefits programs to evaluate the true impact of management interventions. If new "value-based benefits designs" are truly going to add value, they must draw treatment, cost and impact links across traditional benefits lines.

IBI's analysis is based on a master research database provided to IBI by Ingenix of more than 1 million covered lives for 17 employers, including up to three years of claims experience for medical, pharmacy, short-term disability, long-term disability and workers' compensation. The RA study population reported on in this study includes 5,483 employees.

IBI thanks its research partners, Dennis Scanlon, Ph.D., and John Moran, Ph.D., of Penn State University, and the following for their guidance in this research: Art Small, M.D., Genentech; Neil Austin and Ken Theriault, Ingenix; Spencer Borden, M.D., Johnson & Johnson; Ron Leopold, M.D., MetLife; Joseph Doyle, R.Ph., Novartis Pharmaceutical Corp.; Richard D'Angio, Pharm.D., and Jon Vlasnik, Pharm.D., Pfizer, Inc.; and Ron Ozminkowski, Ph.D., Thomson Healthcare.

Authors:
Kimberly Jinnett, Ph.D.
Thomas Parry, Ph.D.
Yifan Lu, Ph.D.

Integrated Benefits Institute

The **Integrated Benefits Institute** is a national, nonprofit organization supported by employers and their benefits products and services suppliers that have an interest in integrating employee benefits and investing in workforce productivity through improved workforce health and managing disability. To best serve the needs of employers and employees, IBI identifies and analyzes health and productivity issues as they cut across traditional benefits programs. IBI's programs include research and health and productivity educational forums. IBI also provides a full range of health-related benefits performance measurement and benchmarking tools and has been the sole, single-source occupational and non-occupational absence and disability benchmarking data collector and reporter for the past eight years.

Ingenix (www.ingenix.com) unites the brightest minds to transform organizations and improve health care through information and technology. Together with its clients and business partners, Ingenix is improving the affordability, quality, usability and accessibility of health care. Ingenix is growing at a rapid pace, investing significantly in research and development. The company is a wholly owned subsidiary of UnitedHealth Group, which ranks among *Fortune* magazine's 2006 listings of the 50 largest U.S. corporations and was ranked #1 among the most admired health care companies.

Integrated Benefits Institute
595 Market Street, Suite 810
San Francisco, CA 94105

415.222.7280
info@ibiweb.org
www.ibiweb.org
www.benefitsintelligence.org
www.ibibenchmarking.org

A Broader Reach for Pharmacy Plan Design

Principal Findings

- **There is a strong link between higher out-of-pocket pharmacy expenses and greater lost productivity for rheumatoid arthritis (RA)** through the intervening steps of reduced medication adherence resulting in higher short-term disability incidence and longer duration.

- **The productivity impacts of pharmacy plan design for RA in this research are understated** because this analysis focuses only on short-term disability lost time and doesn't include the impacts of presenteeism or of any sick time taken before disability benefits eligibility begins.

- **To evaluate the true impact of management interventions, it is important to integrate data across all health-related programs.** Linking medical and pharmacy data is an important first step but isn't a sufficient basis upon which to make intervention decisions and can produce perverse results.

- **Tailoring interventions to evidence-based medical guidelines and understanding how those guidelines influence productivity outcomes is an important next step.** If new "value-based benefits designs" are truly going to add value, they must draw treatment, cost and impact links across traditional benefits lines.

Contents

Background

Employers pay close attention when prices increase. Upward trends always have the employer's eye, whether associated with revenue growth opportunities, production challenges from more-costly raw materials, or pressure on employee benefits from higher health-related costs. Nothing has received more attention in the employer benefits community in the past decade, however, than growth in pharmaceutical expense.

Between 1995 and 2000, annual growth in pharmaceutical costs outpaced cost trends for physician, hospital outpatient and hospital inpatient services.

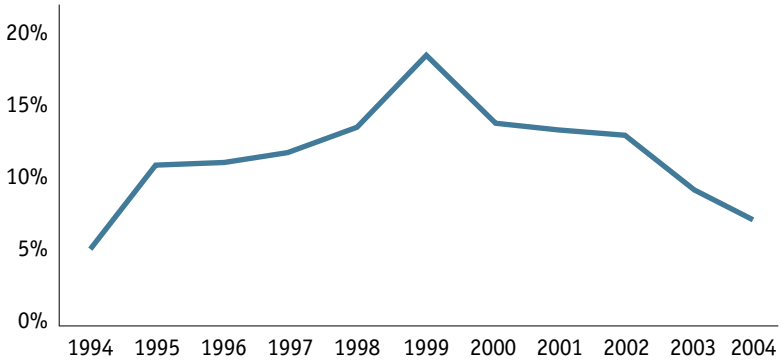
Pharmaceutical Cost Surge

Between 1995 and 2000, annual growth in pharmaceutical costs outpaced cost trends for physician, hospital outpatient and hospital inpatient services.[1] Not surprisingly, employers began to focus on controlling costs in the pharmaceutical program benefits silo. Although pharmacy annual cost growth began easing in 2000, by 2004 it remained about twice the rate of inflation and continues as an employer cost-control target.

Tiered benefits plans, higher copays, coinsurance and higher deductibles are all strategies that employers have used to affect employee behavior and control costs in the pharmaceutical program. In fact, those strategies are often successful in reducing pharmacy expenses.[2] One study in 2002 found that doubling copays reduced drug costs 19% to 33% for 25 employers.[3] Another found that doubling copays in a two-tiered plan reduced overall drug spending by one-third.[4]

Pharmaceutical Cost Trend

Annual growth rate of pharmaceutical costs



Broadening the Focus

Researchers, however, have begun to document the impact of pharmacy benefits changes and medical costs.[5,6,7,8,9] A recent study of the impact of a $1,000 annual cap on drug benefits found that drug consumption was reduced and clinical outcomes suffered. Although pharmacy costs for the targeted drugs were down 31%, actual medical cost increases made up for those savings in higher relative rates of emergency department visits and higher nonelective hospitalization. In addition, those receiving the capped pharmaceutical benefits were more likely to be nonadherent to long-term drug therapy.[10]

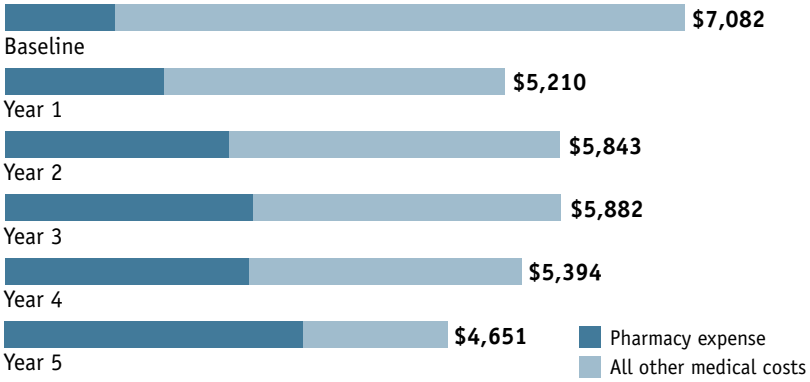
Employers have begun asking a new question: *What's the impact of squeezing the pharmacy program on other medical and health-related costs?* In Asheville, North Carolina, a coalition of smaller employers took a unique approach to assisting their employees with diabetes, asthma, hypertension and lipid-therapy management. By getting local pharmacists involved in providing a management and coaching program and by providing participants no-cost drugs, screening and supplies, these employers found significant overall cost savings compared with preprogram results.[11,12]

In the baseline period, pharmacy benefits represented less than 20% of the total $7,082 in insurance payments. By the end of the five-year study period, average medical costs per patient fell by one-third while the pharmacy cost component increased almost threefold to two-thirds of total medical expenditures. More significant from a productivity view, average sick days dropped by almost half.

Pitney Bowes also took a broader view of the links between pharmacy, medical care and business outcomes. In 2001, the company redesigned its pharmacy benefits to make drugs for asthma, diabetes and hypertension—three conditions affecting medical and productivity costs for the company—more accessible. The company believed that financial barriers to proper medication adherence made no sense, neither for the company nor its employees. Pitney Bowes moved these drugs from the third and second tiers (with copays of 50% and 30%, respectively) to the first tier, with a 10% copay. After the first year, Pitney Bowes found that overall costs had increased 8.3% compared with 15% for benchmark companies; emergency room visits were down by a quarter, total health-care costs for diabetes patients fell by 6% and short-term disability days fell by approximately half.[13]

Asheville Project Results

Over the five-year study period, average overall medical costs fell while pharmacy costs increased



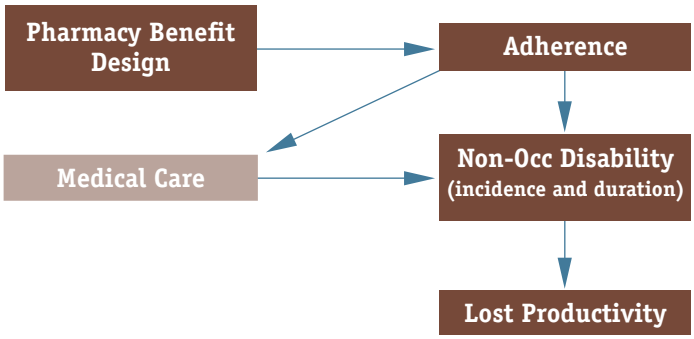
This linkage of medical interventions to business-relevant outcomes makes Pitney Bowes and the Asheville project particularly stand out in the discussion of the impact of pharmacy plan design. IBI's survey of 269 chief financial officers published in 2002 shows that more than 60% believe that the right pharmacy benefit can decrease total health-related costs, including absence, disability and lost productivity.[14] In a broader arena, more than six in 10 of the 624 employers participating in an IBI survey of future employer medical cost–control strategies told IBI that they plan to manage the economic burden of health by managing health in concert with absence, disability and lost productivity.

The Business-model Research Issue

For this research, IBI extends the model—bringing pharmacy plan design together with the broader interests of employers in health-related productivity. To investigate this connection, we used a master research database provided by Ingenix that includes up to three years of claims experience for medical, pharmacy, short-term disability (STD), long-term disability and workers' compensation.[15]

Key Linkages in Our Research

A focus on disability and lost productivity



In this research, we first examine how pharmacy design influences drug adherence and then analyze separately the impact of drug adherence on non-occupational disability (examining both disability incidence and duration). Finally, we model disability-based lost productivity using models developed by IBI and Dr. Sean Nicholson of Cornell University. We touch on the medical care aspects of these relationships but focus primarily on the adherence/disability links.

Selecting the Medical Condition for Study

For this first study, we needed to select a single health condition to properly link the pharmacy benefit to STD by medication adherence. We chose the condition based on the following criteria:

- Clear medical treatment guidelines, particularly regarding prescribed medication
- Strong connection between medical condition and work disability
- Evidence of relationship between medication compliance and functional status

Given these criteria, we selected rheumatoid arthritis because of its strong link to medication adherence, disability and functional status. (See the Appendix for a detailed discussion of IBI's selection of RA for analysis.)

Rheumatoid arthritis particularly affects people at the height of their careers. Individuals with RA often have three times the medical costs, two times the hospitalization rate and 10 times the work disability rate of an age- and gender-matched population.[16] Disability and work-loss costs are estimated to be three times higher than medical costs for RA.

There is a narrow range of well-defined drugs to treat RA. We include two types of drugs in our analysis: disease-modifying anti-rheumatic agents (DMARDs) and symptom-relieving drugs. DMARDs delay progression of the disease by lessening joint destruction and protecting functional status; symptom-relieving drugs are used to treat joint inflammation and pain.

In this research, we first examine how pharmacy design influences drug adherence and then analyze separately the impact of drug adherence on non-occupational disability.

Linking the Pharmacy Benefit to Medication Adherence

We first examine how pharmacy plan design can influence employee willingness to adhere to a drug regimen.

To estimate the effect of out-of-pocket expense on medication adherence behavior for the two classes of RA drugs, we used the price index methodology[17] developed by Dr. Dana Goldman of RAND.[18]

Evidence-based medical treatment guidelines suggest that access to oral and injectable disease-modifying drugs be available for *all* RA patients. The guidelines call for continuous access to DMARDs to modify disease progression and intermittent access to symptom-relieving drugs. The National Committee for Quality Assurance (NCQA) recently incorporated a quality measure into the 2006 Health Plan Employer Data and Information Set (HEDIS) to support greater use of DMARDs among individuals with RA. Clinical experts recommend that at least 80% of RA patients should be the minimum target to benefit from disease-modifying drugs.[19]

Adherence to a prescribed medication regimen should be a primary goal for pharmacy plans—and a key determinant of both medical costs and outcomes.

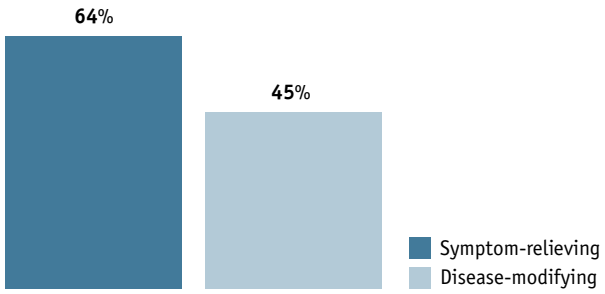
Employee Cost Burden and Medication Adherence

RA disease-modifying drugs have slightly lower out-of-pocket costs for employees for a 30-day drug supply than do symptom-relieving drugs: the average out-of-pocket cost for disease modifying drugs is $26 (median of $10), whereas the average cost for symptom-relieving drugs is $28 (median of $18). Total combined costs for employees and employers over an entire year can be as high as $18,000; injectable DMARDs administered in a clinical setting can cost twice as much.[20] The association of employee out-of-pocket costs and adherence is key to understanding the impact of plan design on broader outcomes.

Adherence to a prescribed medication regimen should be a primary goal for pharmacy plans—and a key determinant of both medical costs and outcomes—so we examined the adherence levels for the two drug classes. We found that fewer than two-thirds (64%) of the employees fill at least one script for symptom-relieving drugs, whereas only 45% fill at least one script for disease-modifying drugs. When we use the term *script* in this paper, it means that a pharmacy claim was filed for a prescription drug. We have no way of knowing whether a physician prescribed medication and an employee simply did not fill the prescription.

Medication Adherence

Percentage of employees filling at least one script



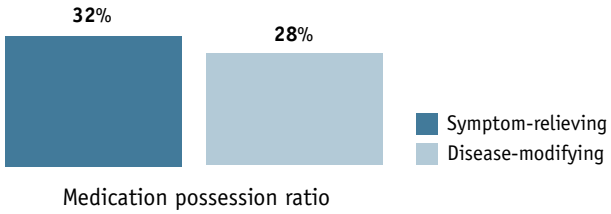
There is even less adherence to having a supply of the script available as needed (for those filling at least two scripts). We assessed script availability by constructing a standard adherence measure—medication possession ratio (MPR)—which is measured as the percentage of time during the employee's benefits eligibility period that an employee is in possession of the drug. The MPRs suggest intermittent use of these drugs over time.[21] Such intermittent use might be expected for the symptom-relieving

drugs that had an MPR of 32%. But we would expect more continuous possession of the disease-modifying drugs, not the 28% MPR we discovered.[22]

These results are a far cry from the minimum recommended guideline of 80%. Our findings are consistent with the NCQA's findings as well, that roughly 50% of the general population with RA has ever received a script for a DMARD.

Medication Adherence

Percentage of time script is available



The Effect on Adherence of Increasing Copayments

Employers increase copays to limit use of pharmaceuticals, thereby reducing the employers' financial exposure for the cost of the benefit. The question we address here is: *To what degree would increasing copays affect script-filling behavior?* We examined the impact of increasing copays by $5, $10, $15 and $20 on patient willingness to fill at least one prescription for disease-modifying and symptom-relieving drugs for RA.

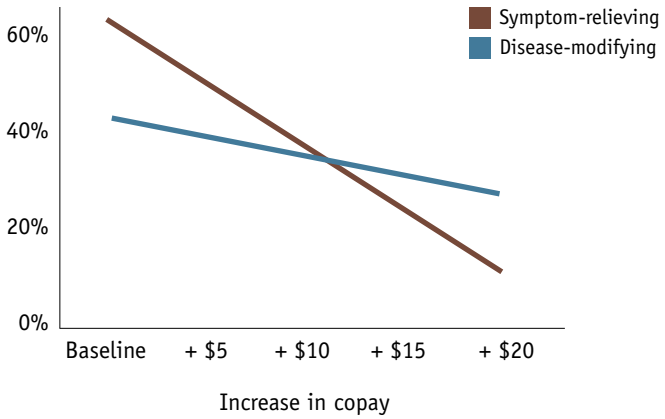
Employee demand for these drugs is strongly price-sensitive to increasing copays. We found that adding an extra $20 in copay would reduce by 35% the share of employees filling at least one script for a disease-modifying drug. Adding $20 to the symptom-relieving drug copay would reduce by 84% the share of employees filling at least one script.

Thus, the two drug types have a different response to price changes. We would expect demand for disease-modifying drugs to be less price-elastic (tending to maintain a level of demand regardless of price) because of the drug's impact on the disease. Alternatively, demand is more price-elastic for symptom-relieving drugs, which have many over-the-counter alternatives. Recent research corroborates these findings.[23]

Given that the drugs are prescribed for those diagnosed with RA, the increased unwillingness of patients to fill prescriptions based on an increase in copay requirements is troublesome. Patients apparently make medical decisions based on price rather than the physician's judgment. Note that this analysis makes no distinction between generic or brand-name prescriptions, although price differences were taken into account in the analysis.

Impact of Out-of-pocket Cost

Percentage of employees filling at least one script at varying copay requirements



Linking Medication Adherence to Disability

Having established that pharmacy plan design affects medication adherence in our sample, we now examine the impact of differing adherence rates on disability incidence and duration for RA.

Previous research shows the connection between pharmaceuticals and lost workdays,[24,25] but we are not aware of any research that connects medication adherence to the incidence and the duration of short-term disability. By establishing this connection, we provide empirical evidence of the link between medical treatment (in this case pharmaceutical treatment) and lost work time through STD episodes.

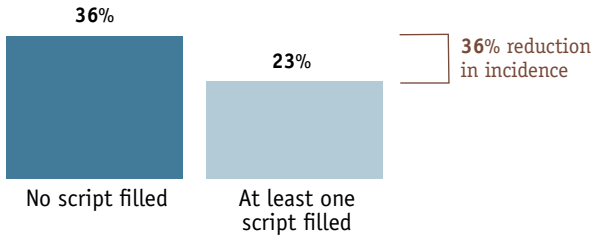
We examine the impact on disability of script-filling behavior and of medication possession ratio for disease-modifying drugs. After controlling for employee clustering within employer groups (some employers simply have sicker employees than others), gender, age and co-morbidity, we find a significant impact of script-filling behavior on STD. RA employees *not* filling a disease-modifying script have an STD incidence of 36%, whereas for those filling at least one script the STD incidence rate drops to 23%—a 36% reduction in incidence. We also found statistically significant results in modeling the impact of MPRs on disability incidence. Thus, filling at least one script and having greater access to DMARDs over time reduces STD incidence.

We also find a significant—albeit not as dramatic—impact of DMARD script-filling on the duration of short-term disability. Controlling for the same factors, we see a 6% reduction in disability duration when comparing the two groups (close to a full workweek saved when at least one disease-modifying script is filled).

The difference in incidence and duration results makes intuitive sense. We would expect a drug that slows down the progression of a disease to have a much bigger impact on preventing the incidence of disability than on its duration once a person is already on disability leave. This increase in disability for those not filling a script should provide a cautionary note to employers that are tempted to view pharmacy plan design impacts solely within the pharmacy benefits silo.

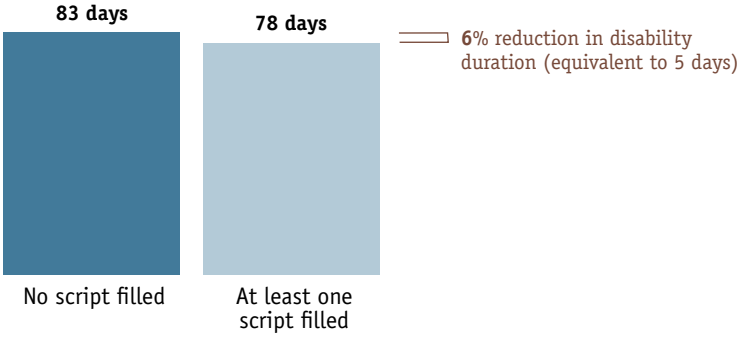
Filling at Least One Disease-modifying Script Reduces STD Incidence

Percentage of employees with **at least one STD claim** based on script-filling behavior



Filling at Least One Disease-modifying Script Reduces STD Duration

Average STD disability days per person based on script-filling behavior



Results Across Employers

For the employers in this sample, there is an inverse relationship between the incidence of STD and the relative share of employees filling at least one DMARD script. For example, the two employers in the sample with fewer than 20% of their RA-diagnosed employees using DMARDs were also the two employers with the highest rates of STD.

Given the degree of variation across employers in both their employees' use of DMARDs and STD incidence, it is important to also separate the effects of the employer characteristics from the employee characteristics on both medication adherence and STD incidence.

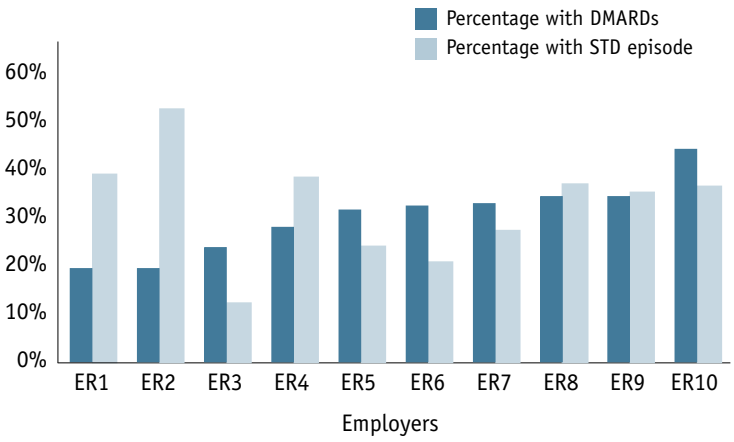
Accordingly, we ran a series of multilevel models that adjusted for the clustering of employees by employer. These analyses supported our earlier findings that a higher employee share of medication costs results in lower DMARD adherence and that lower DMARD adherence results in a greater likelihood of an STD episode with a longer duration.

As shown in the exhibit at lower left, the medication possession ratio for DMARDs was the strongest predictor of STD incidence: as MPR increases, the likelihood of an STD episode decreases. The next-strongest predictor was gender: males are less likely than females to file an STD claim among this population with RA. The third-strongest factor is medical co-morbidity: as the number of additional diagnostic groups for an employee increases, the likelihood of an STD episode increases as well. Though age has a shallow gradient, it is significant: as age increases, there is a diminished likelihood of an STD episode. Because RA tends to strike in the prime working years, this may reflect the nature of the disease itself and when it manifests most acutely.

These findings—that employee share of pharmacy costs influences medication adherence which, in turn, influences STD incidence and duration—are robust across models, controlling for gender, age and co-morbidity and for the clustering of employees within distinct employer groups. Indeed, the medication adherence measure was the strongest predictor of STD incidence in our fully controlled models.

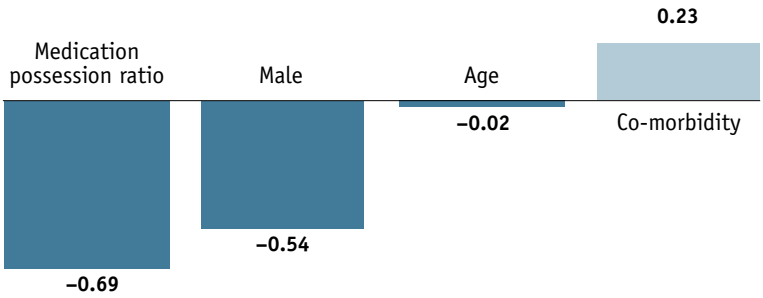
The Link Between DMARDs and STD Incidence by Employer

Based on employee share of medication costs across 10 employers



Contributors to STD Incidence

Likelihood of an STD episode based on various factors



The Impact of Disability Lost Time on Lost Productivity

The final part of the model connects the incidence and the duration of disability to lost productivity.

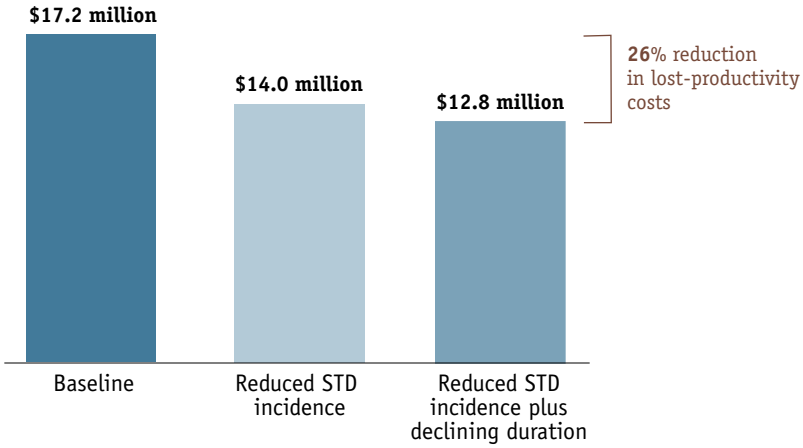
Here we ask what the productivity savings would be if the employees in the group that don't fill scripts—55% of all RA sufferers—filled scripts at the same rate as employees in the script-filling group. We calculate disability-related lost productivity as the opportunity cost of lost time (based on IBI's work with employers in quantifying the full costs of absence, lost productivity and health and on the work of Dr. Sean Nicholson of Cornell University).[26]

If the group of RA sufferers filled scripts at the same rate as the script-filling group, their employers would save $4.4 million in lost productivity—$3.2 million from reduced STD incidence and another $1.2 million from declining disability duration.[27]

This estimate is conservative because the comparison group comprises people who fill as few as one disease-modifying script as opposed to those on an ideal course of the drug regimen. Even with this conservative approach, however, there is a significant effect on productivity: a 19% effect for reduced incidence and a 26% total effect for both incidence and duration.

Impact on Lost-productivity Costs

Potential productivity costs saved from increased script-filling



How Does Medical Care Fit In?

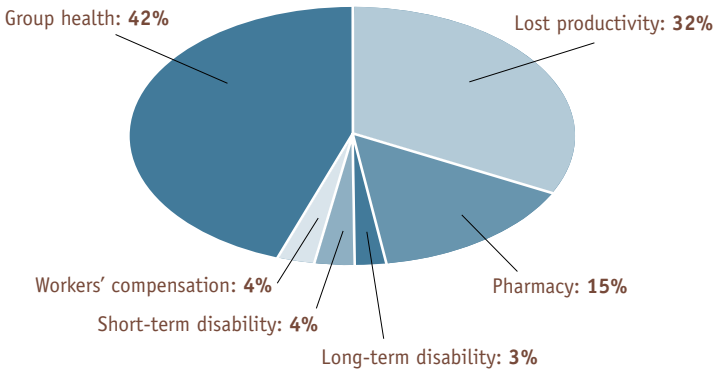
Historically, employers have had a singular focus on medical care at the center of their cost-control efforts. How do the total costs for medical care for RA—from both the employer and the employee perspectives—compare with lost productivity for cases involving disability?

The broader discussion puts medical care in the context of these "full costs"; payments for group health, pharmacy, workers' compensation, short- and long-term disability and the resulting lost productivity from absence for these programs are shown here. These *full costs* emphasize two important points. First, the absence impact of disability through lost productivity is a significant expense—twice as large as pharmacy expenditures and second only to group health. Second, employers interested in managing all health-related costs must understand the interconnections among all benefits programs if they are to serve the interests of both their company and their employees.

This lost-productivity estimate, however, is based only on time lost from disability. If we include estimates of incidental absence from IBI's previous full-cost studies for employers and the relative impact of presenteeism lost productivity (that is, the loss in productivity associated with decrements of health-related performance at work) from the work of Dr. Ronald Kessler of Harvard Medical School, lost productivity becomes fully half of the total and group health drops to less than one-third.

Full Costs for Rheumatoid Arthritis

Cost of lost productivity is more than twice that of pharmacy



Practical Implications

This research shows that there are strong links between pharmacy plan design for rheumatoid arthritis and disability-related lost productivity. The links in that chain are forged as follows:

- Higher out-of-pocket expenses for patients reduce medication adherence
- Lower medication adherence is associated with higher STD incidence and longer STD duration
- Higher STD incidence and longer STD duration result in higher disability costs and greater lost productivity

There are several implications for employers from this research:

- **Cost-control strategies based only on pharmacy silo results are short-sighted.** This research encourages employers and their supplier partners to get out of the pharmacy silo and look beyond short-term pharmacy savings or even related medical costs and encompass disability and lost-productivity outcomes in their plan design assessments. Although it is a step in the right direction to link pharmacy and medical data, only a part of the total cost picture will be captured if employers limit themselves to these data sources. Because much research has shown that medication adherence has real implications for preventing functional decline, those who work with medical and pharmacy data need to link specific medical conditions with specific drugs. Furthermore, the most recent study by RAND shows that increased copayments for needed specialty drugs do not necessarily cut total healthcare costs.[28]

- **Including lost productivity associated with the disability waiting period and with presenteeism will make proper pharmacy plan design even more important.** Because this analysis focuses only on disability lost time and doesn't include the impacts of presenteeism or of time off taken before disability benefits eligibility is triggered, the productivity impacts of pharmacy plan design for rheumatoid arthritis are clearly understated.

- **Employers need to think broadly about what influences adherence.** Research cited in this report shows that employees are price-sensitive to out-of-pocket expense for drugs. Employers also must address other factors that influence adherence—drug side effects and lifestyle choices—however, if they are to truly maximize the impact of pharmacy plan design. IBI is currently engaged in research on incentives and disincentives for health and productivity behaviors that will assist employers in designing their overall programs.

- **Finally, this research demonstrates how important it is to integrate data across all programs so that the full effect of interventions can be evaluated.** If only medical and pharmacy cost data are linked, the full picture of costs and implications for employers and their employees would be poorly understood. As a result, short-term decisions to reduce medical spending or shift more of the cost burden to employees might result in significant lost-productivity costs. Tailoring interventions based on evidence-based guidelines and understanding how those guidelines influence productivity outcomes will be an important next step. If new "value-based benefits designs" are truly going to add value, they must draw these links across traditional benefits lines.

If only medical and pharmacy cost data are linked, the full picture of costs and implications for employers and their employees would be poorly understood.

Appendix

Selecting the Medical Condition for Study

For this first study, we needed to select a single health condition to properly link the pharmacy benefit to STD via a therapeutic class of drugs and related medication adherence. We reviewed a variety of medical conditions for this first study. Depression, diabetes, allergic rhinitis, hypertension and arthritis[29,30] rose to the top of the list when assessed against the following selection criteria:

- Clear medical treatment guidelines, particularly regarding prescribed medication
- Strong connection between medical condition and work disability
- Evidence of relationship between medication compliance and functional status

Given these criteria, we selected arthritis as the first disease state for analysis. We found arthritis to be particularly intriguing because of its strong link to medication adherence, disability and functional status.

Within the broad category of arthritis, we selected rheumatoid arthritis for scrutiny. Rheumatoid arthritis is a chronic autoimmune disorder often characterized by progressive joint destruction and multisystem involvement. It affects approximately 2.5 million Americans and disproportionately affects women. There is no cure; consequently, the goal of treatment is to slow the progression of disease and thereby delay or prevent joint destruction, relieve pain and maintain functional capacity.[31] Individuals with RA often have three times the medical costs, two times the hospitalization rate and 10 times the work disability rate of an age- and gender-matched population.[32] Annual costs rise as the duration of the disease increases and as function declines. Disability and work-loss costs have been estimated to be three times higher than medical costs.

Experts tell us that there is a narrow range of well-defined drugs to treat RA. We chose two therapeutic classes of drugs to analyze in the treatment of RA: disease-modifying anti-rheumatic drugs (DMARDs) and symptom-relieving drugs. Evidence-based drugs to treat RA can be grouped into two classes: first, those that modify the progression of the disease (so-called DMARDs, anti-tissue necrosis factor [anti-TNF] agents, biologics and anti-malarials) and, second, those that treat RA symptoms (such as anti-inflammatories, Cox-2 inhibitors and analgesics). The disease-modifying drugs are used to delay progression of the disease by lessening joint destruction and protecting functional status. The symptom-relieving drugs are used to treat joint inflammation and pain. Some of the specific subtypes of drugs used include those listed at left (a more detailed list of specific drugs included in the study is available from the authors).

Poor access to DMARDs (including biologic DMARDs) has been associated with a loss in function and accelerated disability,[33] and several studies have shown a strong connection between RA and work disability.[34,35]

Important Rheumatoid Arthritis Drugs

Modifying disease progression

- Disease-modifying anti-rheumatic drugs (DMARDs)
- Anti-tissue necrosis factor (anti-TNF) agents
- Biologic response modifiers
- Select anti-malarials used as DMARDs

Treating pain/inflammation symptoms

- Non-steroidal anti-inflammatory drugs (NSAIDs)
- Cyclo oxygenase 2 (Cox-2) inhibitors
- Analgesics

In addition, the National Committee for Quality Assurance recently announced a new HEDIS measure for Disease-modifying Anti-rheumatic Drug Therapy in Rheumatoid Arthritis.[36] The new HEDIS measure assesses whether patients diagnosed with rheumatoid arthritis have been prescribed a disease-modifying anti-rheumatic drug.

One of the challenges in research of this type is to link specific drugs to specific medical diagnoses (typically, this information resides in separate databases without a medical diagnosis code associated with individual drugs; many drugs can treat multiple medical conditions). We also know that patterns of medical care and disability outcomes vary significantly by type of medical condition.[37] Some conditions will present with more disability, some with less, which translates directly into lost work time and an economic impact for the employer.[38] If left untreated, 20% to 30% of persons with RA become permanently work disabled within two to three years of diagnosis.[39]

The RA study population for this research includes 5,483 employees for whom we have medical, pharmacy, disability and workers' compensation data. The average age of the population is 51. Only 14% of this group is under the age of 40, and the same proportion is over 60. RA particularly affects people at the height of their careers. In addition, nearly 60% of this group is female, which is typical for those with RA. All 10 geographic regions of the United States are represented.

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[20] This study relies on pharmacy costs obtained through pharmacy claims data. The maximum amount of total pharmacy costs in one year for DMARDs for employees and employers combined is $18,000 in these pharmacy claims. Injectable DMARDs are often administered in a clinical setting, and associated pharmacy costs are recorded along with corresponding drug codes ("j-codes") in the medical claims data. For the RA sample in this study, we compared the costs of injectable DMARDs via the medical claims to non-injectable DMARDs in the pharmacy claims. Costs for injectable DMARDs were, on average, twice the cost of non-injectables.

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