Using Predictive Modeling to Target Value-Based Prescription Management and Pharmacy Benefit Efficiency

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PRIME THERAPEUTICS®

Prime Therapeutics

- Pharmacy Benefits Manager (PBM)
- Privately held organization owned by 10 BCBS plans (FL, IL, KS, MN, NE, NM, ND, OK, TX, and WY)
- 14.6 million covered lives; 36 million weighted lives across 16 different BCBS plans (coast-to-coast)
  - 900,000 Medicare Part D lives
  - 9.6 million full service PBM lives
    - Claims processing, clinical and medication management, formulary, rebate administration, mail order, specialty pharmacy, national pharmacy network
- Integrate medical and pharmacy claims data for total health care management

Health Expenditures & Quality

- National Health Expenditures (NHE) are increasing[1]
  - Health care cost trends are expected to continue around 7% through 2017 outpacing economic growth
  - Pharmacy spending has been increasing even more quickly than medical spending in the U.S., projected to be 11% of NHE by 2012
- Quality of health care is decreasing[2]
  - U.S. ranked 37 in the world in health care performance
  - Only 55% of Americans receive the care they need, as indicated by medical evidence
  - 79,000 Americans die each year because they do not receive evidence-based care for chronic conditions

1) Keehan S, et al. Health Spending Projections Through 2017. Health Affairs 2008:27:w145-w155.
2) Boehm, Jennifer. “The Road Ahead: Value-Based Design.” Hewitt Associates. 1 May 2007.

Kaiser 2007 Employer Survey

Exhibit 14: Among Firms Offering Health Benefits, Distribution of Firms Reporting the Likelihood of Making the Following Changes in the Next Year, 2007

	Very Likely	Somewhat Likely	Not Too Likely	Not At All Likely	Don't Know
Increase the Amount Employees Pay for Health Insurance	21%	24%	21%	33%	<1%
Increase the Amount Employees Pay for Prescription Drugs	11%	30%	31%	26%	2%
Increase the Amount Employees Pay for Deductibles	12%	25%	28%	34%	1%
Increase the Amount Employees Pay for Office Visit Copays or Coinsurance	13%	29%	28%	28%	2%
Introduce Tiered Cost Sharing for Doctor Visits and Hospital Stays	7%	16%	39%	35%	3%
Restrict Employees Eligibility for Coverage	<1%	4%	29%	64%	3%
Drop Coverage Entirely	1%	2%	15%	82%	<1%
Offer HDHP/HRA‡	3%	21%	30%	46%	<1%
Offer HSA Qualified HDHP‡	2%	18%	32%	45%	3%

‡ Among firms not currently offering this type of HDHP/SO.

Source: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 2007.

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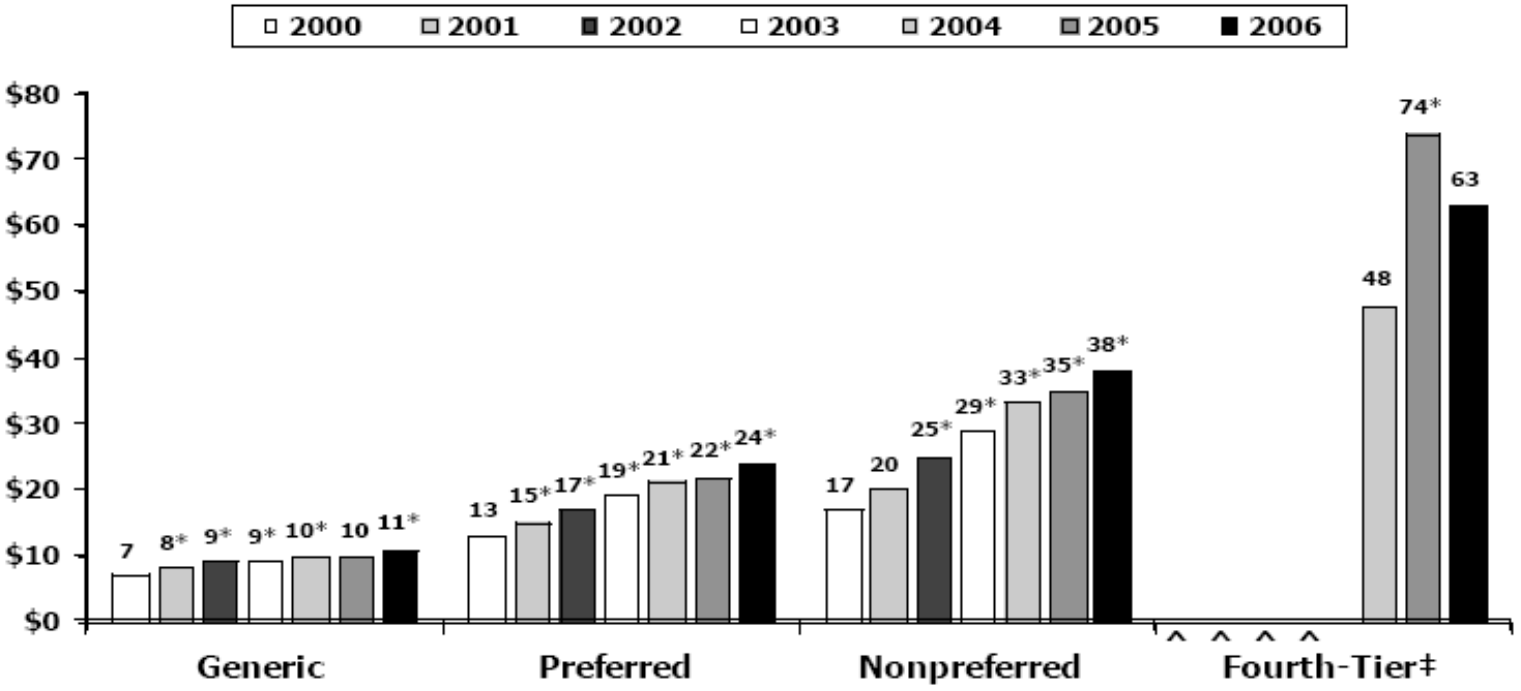
Kaiser 2007 Employer Survey: Prescription Copays

Figure 4: Among Covered Workers Facing Prescription Drug Copayments, Average Copayments, 2000-2006



*Estimate is statistically different from estimate for the previous year shown at p<.05.

^Fourth-Tier drug copay information was not obtained prior to 2004.

‡The average copayments for preferred and nonpreferred drugs include values for firms where cost sharing is the same regardless of drug type. Because in some cases drugs covered as fourth-tier drugs may be covered by health plans through other portions of their coverage (e.g., as part of major medical coverage), the average copayment for fourth-tier drugs is calculated using information from only those plans that have a fourth-tier copayment amount.

Source: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 2000-2006, at http://www.kff.org/insurance/7527/index.cfm.

Value-Based Insurance Design in Action

- Companies like *Pitney Bowes* and *Marriott International* have reduced or eliminated copayments for all users of drugs for chronic conditions, such as diabetes, asthma and hypertension[1,2]
- Consultants are promoting a valued-based approach
  - The Hewitt Value Report Card requires insurers and PBMs to assess utilization of key drug classes and ensure self-funded groups of the efficient use of medications in each drug class

1) Freudenheim, Milt. “To Save Later, Some Employers are Offering Free Drugs Now.” *The New York Times*. 21 February 2007.
2) Mahoney JJ. Reducing Patient Drug Acquisition Costs Can Lower Diabetes Health Claims. Am J Manag Care 2005;11:S170-S176

Value-Based Insurance Design

- Current implementation of value-based pharmacy management
  - Lower cost shares within chronic condition drug class (e.g., statins) for all individuals utilizing medication
    - Antihypertensives, cholesterol lowering, depression, diabetes mellitus (DM), respiratory agents (asthma/COPD)
  - Hypothesis: there is under-utilization of medication and all individuals utilizing medications will have a positive cost-effectiveness ratio
  - Goal: reduce cost as a barrier to medication initiation and persistence
- Increases in Brand ($$$$$) utilization with decrease in generic ($) utilization
- Cost-effectiveness ratio in wrong direction for non-high risk brand utilizers

Value-Based Insurance Outcomes

- Pitney Bowes co-insurance 10% generics, 30% formulary brand, 50% non-formulary brand
  - Value-based benefit design reduced Advair from 50% co-insurance (~$60/mo) to 10% (~$12/mo)
  - Diabetes mellitus (DM) drugs all moved to 10% co-insurance resulted in increased pharmacy expenditures, increased adherence and decreases in medical expenditures compared to benchmark data[1]
- Chernew and colleagues compared medication adherence for a large employer who implemented a $0/$12.50/$22.50 copay value benefit reduced from $5/$25/$45 compared to another large employer who did not change benefit design.[2]
  - Adherence increased an absolute 3% antihypertensives, 4% DM, 3% statins, and 2% inhaled steroids

1) Mahoney JJ. Reducing Patient Drug Acquisition Costs Can Lower Diabetes Health Claims. Am J Manag Care 2005;11:S170-S176
2) Chernew ME, et al. Impact of Decreasing Copayments on Medication Adherence within a Disease Management Environment. Health Affairs 2008;27:103-112.

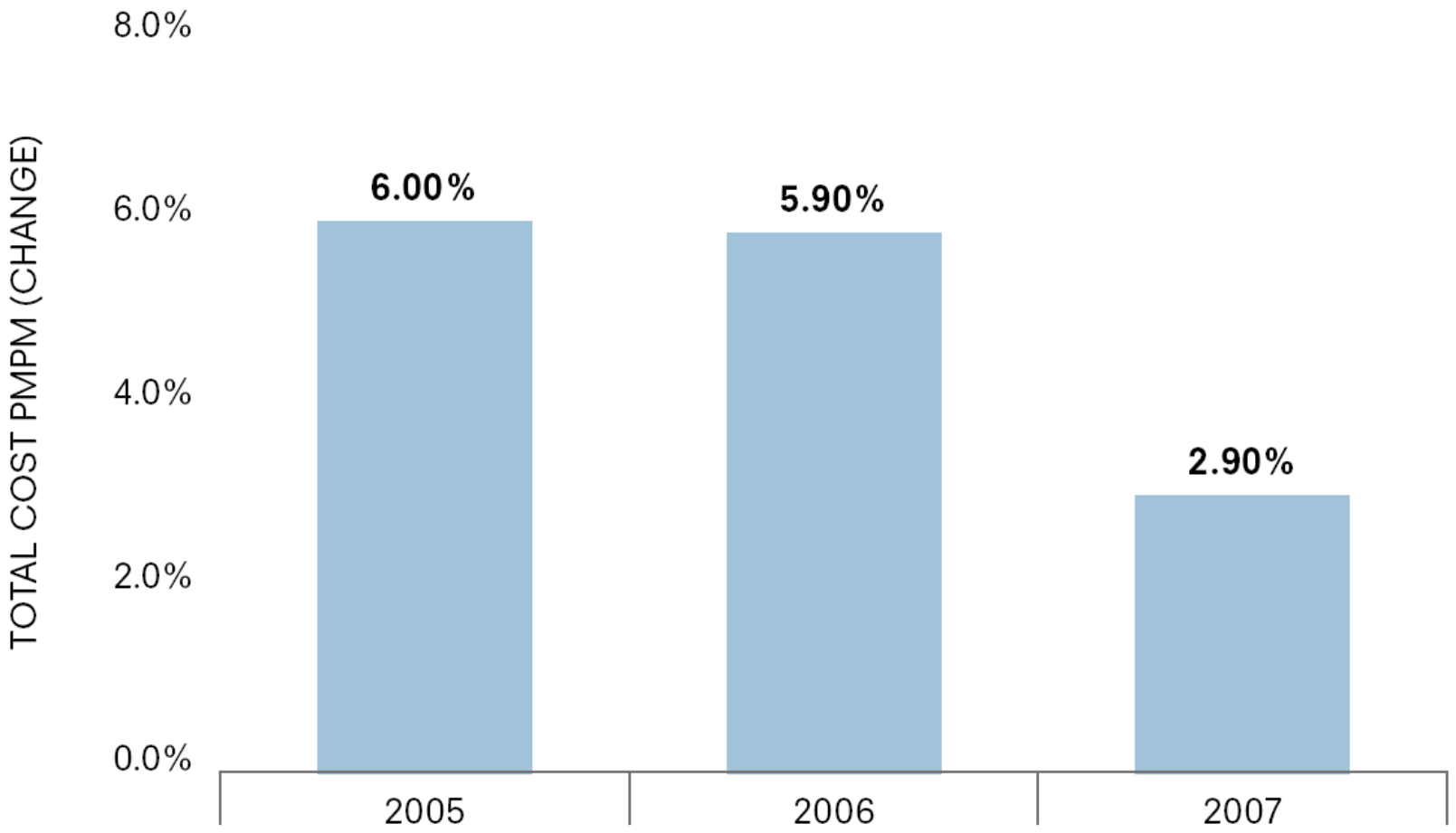
Value-Based Insurance Costs

- Estimated cost of moving from a $5/$25/$45 to a $0/$12.50/$22.50 copay for statins, ACE inhibitors/ARBs (antihypertensives), and asthma medications for 100,000 lives[1]:
  - $2.6 million to $3.9 million cost to employer
    - For statins, the increase in annual cost per patient would be $114 to $168 ($1.26 million to $1.86 million for 11,100 patients) to add 12.4 days of statin therapy per year[2] (absolute increase in adherence by medication possession ratio calculation of 3.39 x 365 days)

1) Fairman KA, Curtiss FR. Making the World Safe for Evidence-Based Policy: Let's Slay the Biases in Research on Value-Based Insurance Design. J Manag Care Pharm 2008;14:198-204.

2) Chernew ME, et al. Impact of Decreasing Copayments on Medication Adherence within a Disease Management Environment. Health Affairs 2008;27:103-112.

Prime's Pharmacy Benefit Trend

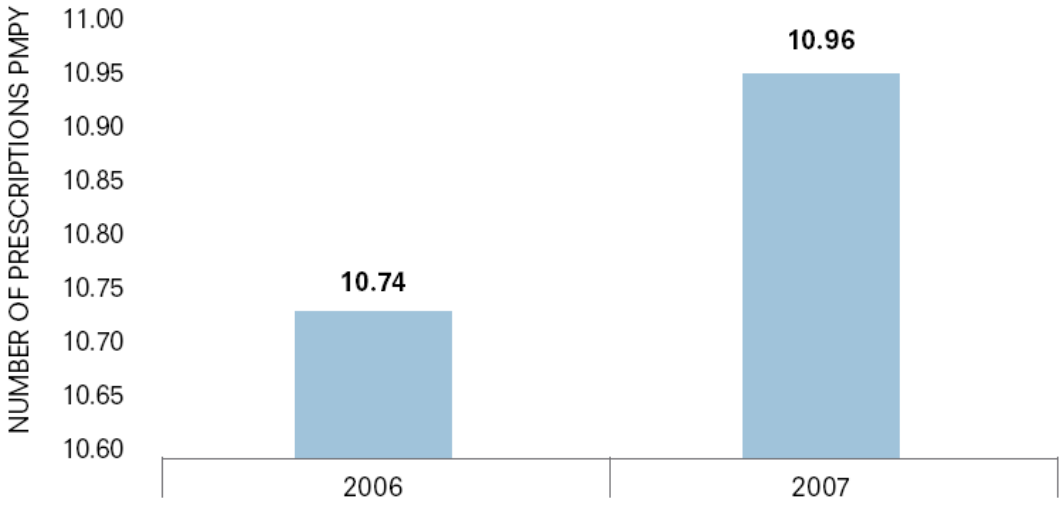


For a copy of Prime's Drug Trend Report, please visit www.primetherapeutics.com under "Recent News" Header click on Drug Trend Insights

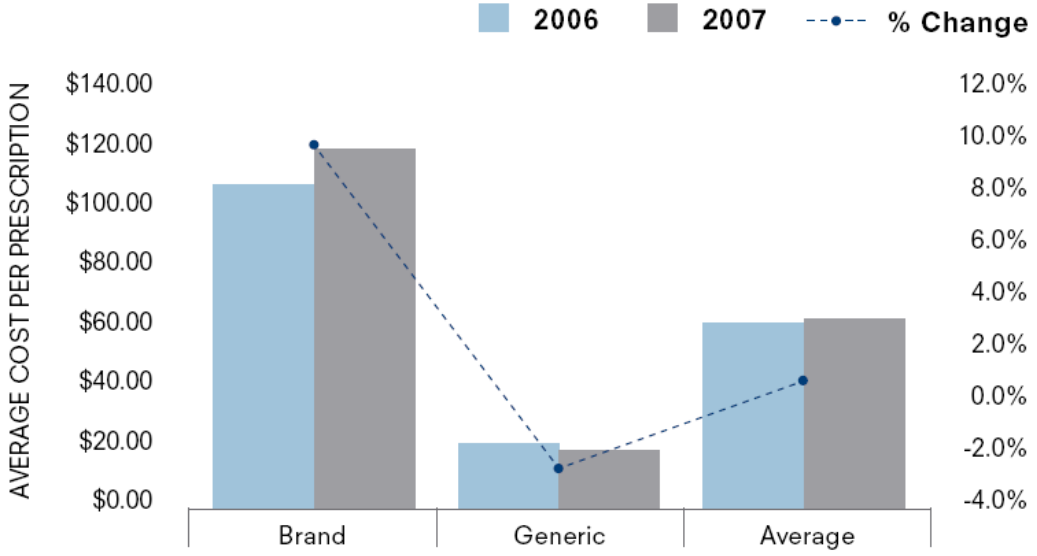
Prime's Core PBM Metric Trends

Parameter	Median	Mean
Total Cost PMPM	$56.83	$60.26
Trend	6.1%	2.9%
Plan Cost PMPM	$41.99	$44.11
Trend	7.1%	2.6%
Member Cost PMPM	$15.53	$16.15
Trend	3.4%	3.8%
Utilization Change	4.3%	2.0%
Inflation	2.7%	3.4%
Drug Mix	-0.6%	-2.2%

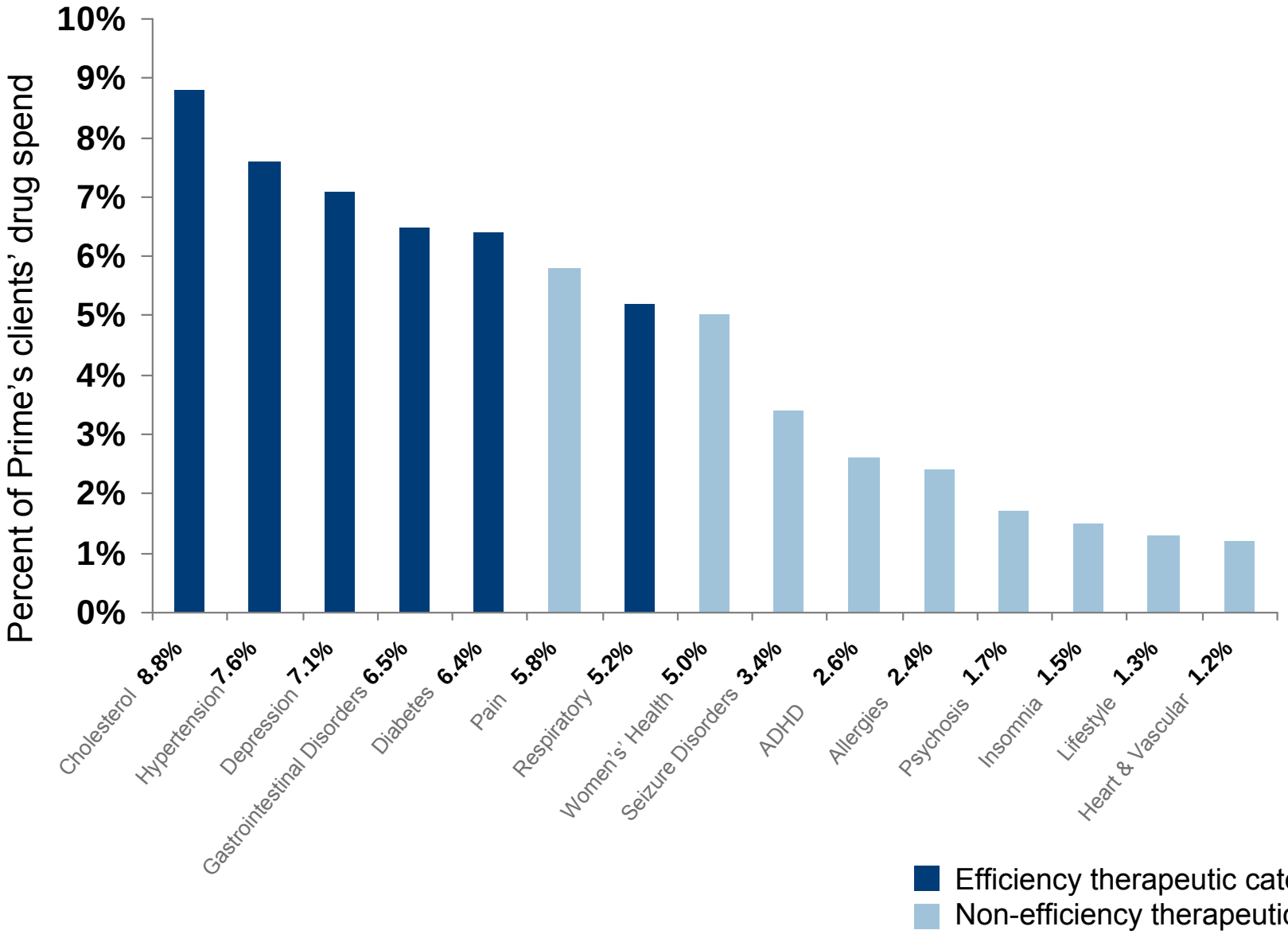
Prime's 2007 Utilization & Ingredient Cost Trend



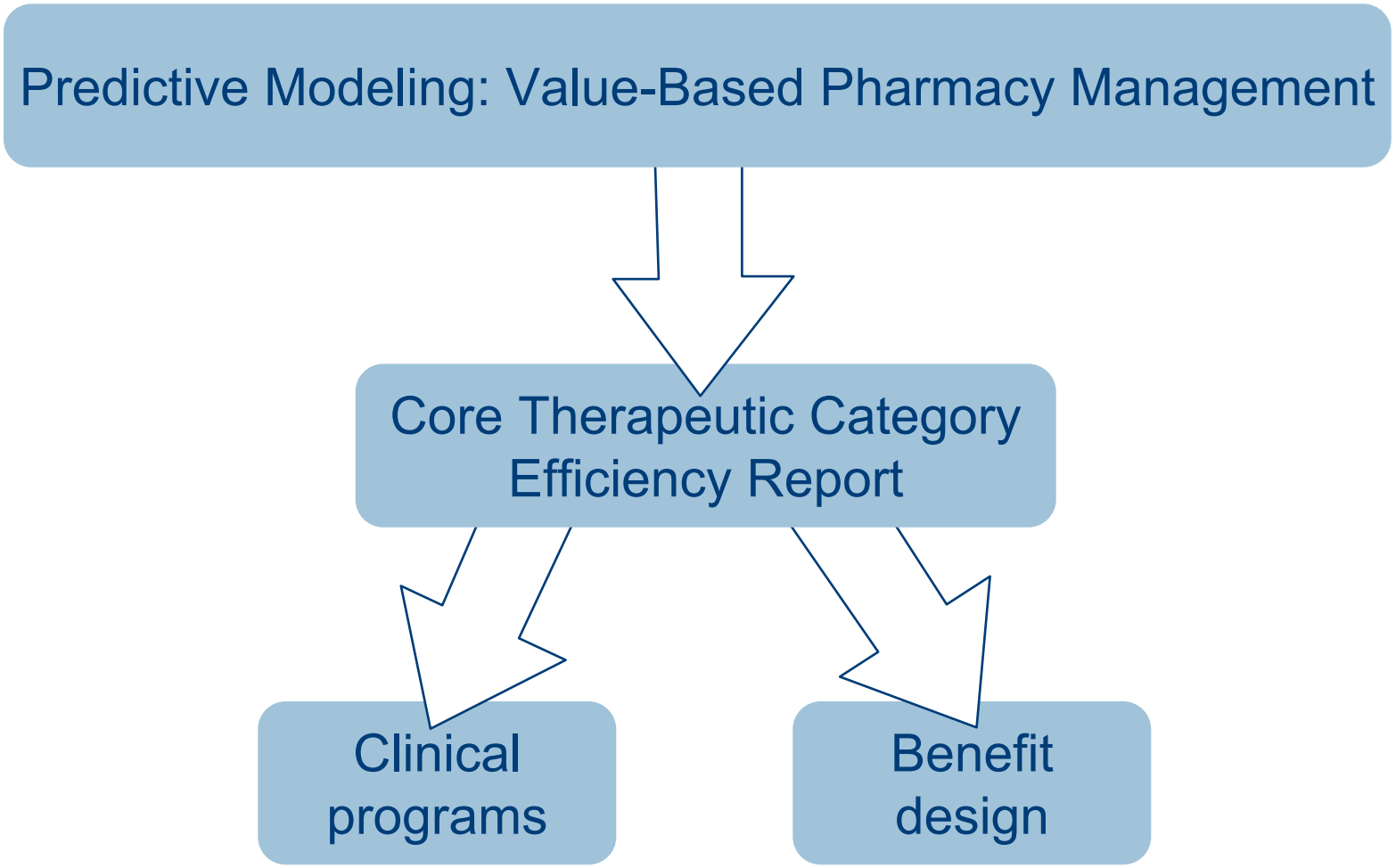
Utilization increased 2.0%
Overall inflation 3.4%
Note: 10.4% Brand inflation



2007 Drug Spend by Core Therapeutic Category

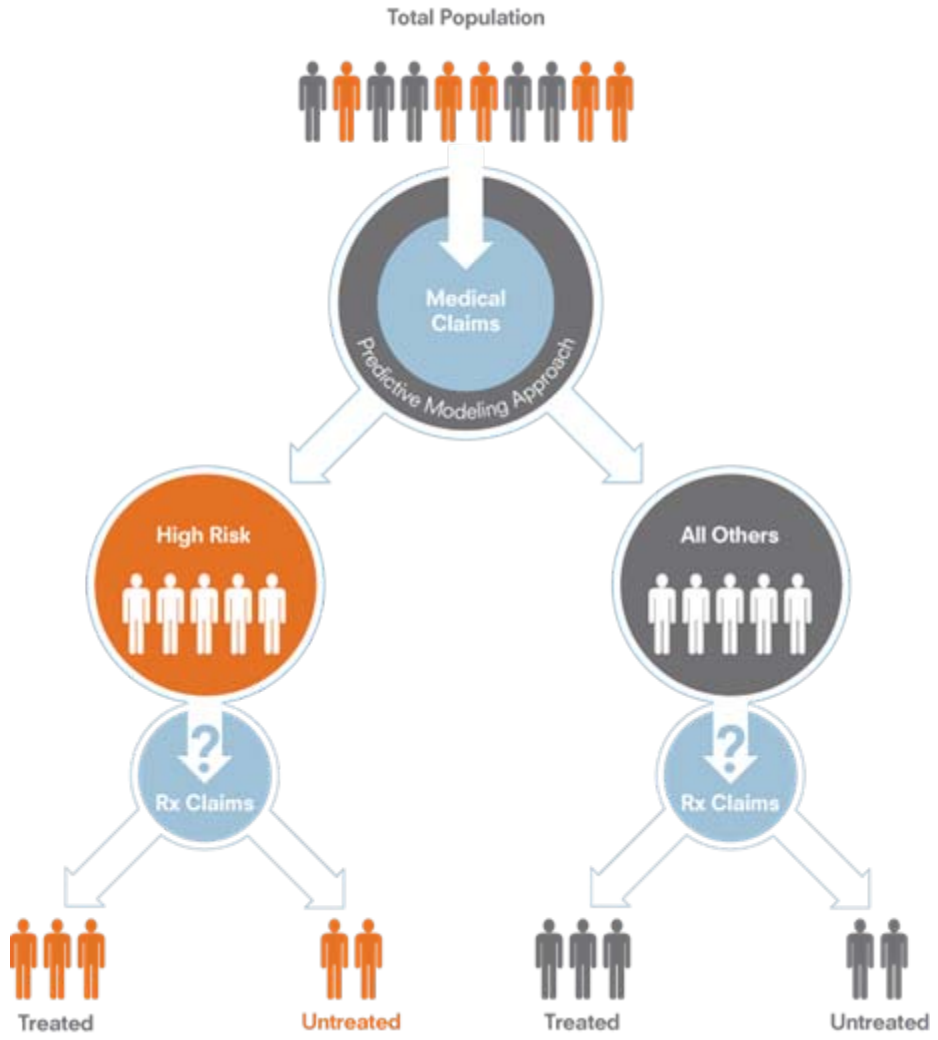


Value-Based Pharmacy Management



Value-Based Pharmacy Management: Predictive Modeling

- Pharmacy and medical data are integrated and predictive modeling logic is applied to identify high-risk members
- High-risk members are at serious medical event risk based on published medical literature

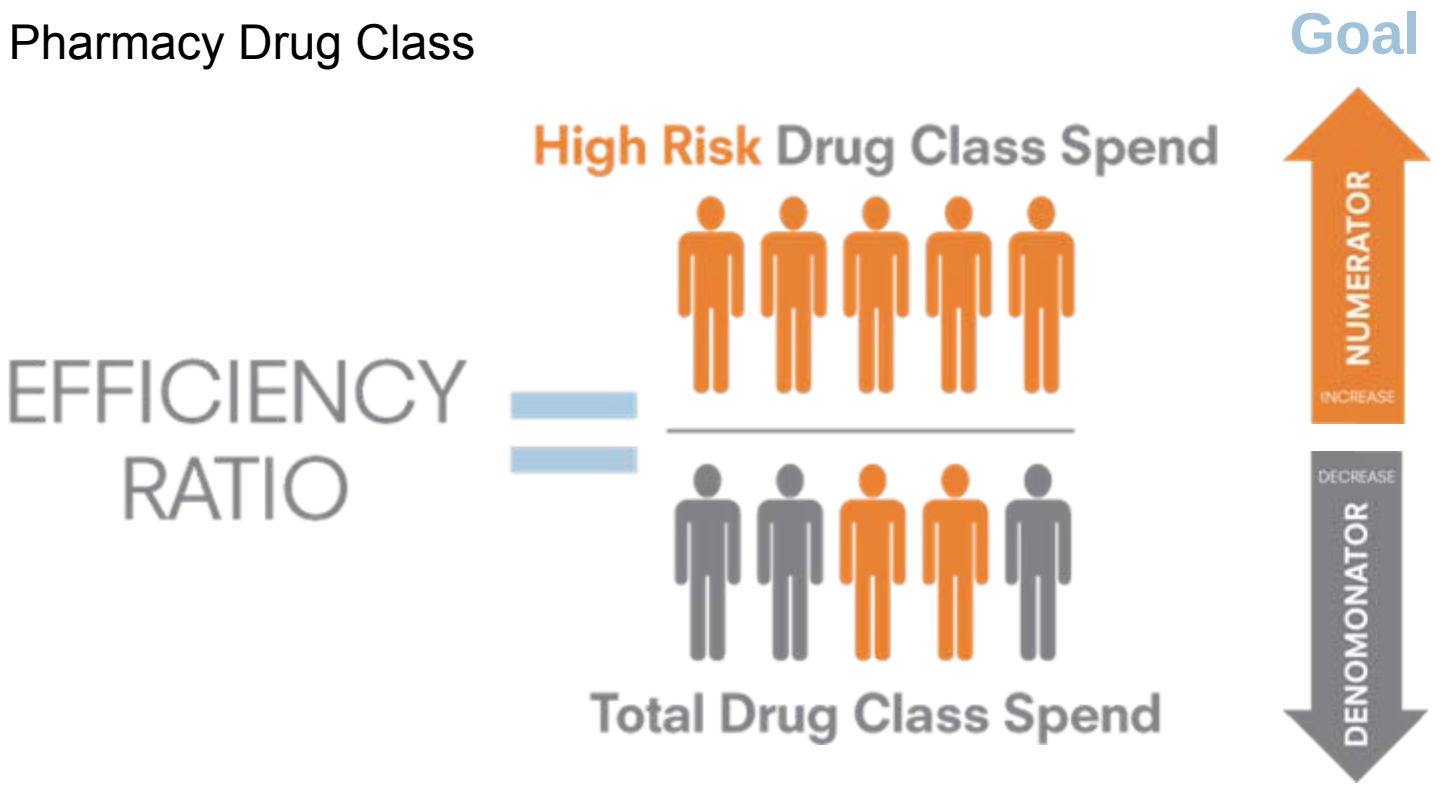


What is Done with the Predictive Modeling Information?

- High risk members pharmacy spend used to calculate efficiency metric (reporting tool)
- Identified high risk members who are not receiving optimal pharmacotherapy
- High risk members loaded into pharmacy benefit:
  - Lowering of member cost-share within specific drug therapeutic classes
  - By pass utilization management programs (e.g., preload a prior authorization for branded statins)
  - Adherence reporting

Predictive Modeling Drives Efficiency

Within Pharmacy Drug Class



The Efficiency Ratio displays drug spend for high-risk members in comparison to the spend for all members within the particular drug class. This metric is used as an indicator of how well your pharmacy dollars are being spent within each drug class.

Predictive Modeling Rules

- Meta-analyses / RCTs demonstrating drug class effectiveness operationalized and guidelines used to define ICD-9 codes identifying high risk
  - Absolute difference in events (NNT) from publications used to estimate event reduction
- Medical claim primary field diagnosis in past two years
- Medication use defined as claim within drug class during past quarter
- Projected savings using DRGs / disability
- Risk status is permanent (not varying)

Predictive Modeling Efficiency Reports

- Core Areas
  - High cholesterol
  - Depression
  - Hypertension
  - Respiratory disorders
  - Gastrointestinal disorders
  - Diabetes
- Quarterly Efficiency Reports
- Adherence Reporting

Cholesterol Lowering Efficiency Report

Efficiency Report
Cholesterol Lowering Drugs
(Statins and Statin Combination Products)

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Employer

4Q2007

KEY METRICS BY RISK LEVEL	ALL MEMBERS	HIGH-RISK MEMBERS
% Using Statin Drugs	11.3%	33.6%
Eligible Members	26,275	
Avg Mbrs/Mth	25,326	
Mbrs Using Statin Drugs	2,973	1,000
$ Total Paid	$459,686	$166,421
# Claims	7,499	2,573
$ PMPM (Total Paid)	$6.05	$2.19
$ Claim (Total Paid)	$61.30	$64.68
% Generic	46.7%	41.6%

MEMBER SUMMARY BY RISK FACTOR	HIGH-RISK MEMBERS
Mbrs with Heart Disease	2,346 8.9%
Mbrs Without Statin Claims	1,346
% Without Statin Claims	57.4%

PROJECTED MEDICAL COST AVOIDANCE *	HEART ATTACKS	STROKES	DEATHS
# Est Events	17	4	5
Est Savings	$664,924	$84,000	$160,000

EFFICIENCY RATIO	ALL MEMBERS	HIGH-RISK MEMBERS
$ Total Paid	$459,686	$166,421
Current Efficiency Ratio	**36.2%**	

High Risk is defined as an ICD-9 diagnosis coded claim in the primary field for cardiovascular atherosclerotic disease (CAD), or congestive heart failure (CHF), or ischemic stroke, or the combination of diabetes mellitus (DM) and a hypertension diagnosis, or a surgical CAD procedure for PTCA, CABG, or stent.

* Estimated medical cost avoidance calculated using event probabilities from original research NEJM 1994;344:1383-1389, Lancet 2002;360:7-22, and meta-analysis Bandolier 2007 www.jr2.ox.ac.uk/bandolier/booth/cardiac/statout.html.

Respiratory Efficiency Report

Employer

4Q2007

KEY METRICS BY RISK LEVEL	ALL MEMBERS	HIGH-RISK MEMBERS
% Using Respiratory Drugs	5.8%	27.0%
Eligible Members	26,275	
Avg Mbrs/Mth	25,326	
Mbrs Using Respiratory Drugs	1,526	412
$ Total Paid	$379,191	$181,182
# Claims	3,998	1,679
$ PMPM (Total Paid)	$4.99	$2.38
$ Claim (Total Paid)	$94.85	$107.91
% Generic	12.6%	12.2%

MEMBER SUMMARY BY RISK FACTOR	HIGH-RISK MEMBERS
High Risk Mbrs	443 1.7%
Mbrs Without ICS Claims	105
% Without ICS Claims	23.7%

LEUKOTRIENE MODIFIER OVER UTILIZATION	UTILIZATION MANAGEMENT OPPORTUNITY
Mbrs With Leukotriene Modifier Claims	687 2.6%
Mbrs Without Asthma Diagnosis	343
% Without Asthma Diagnosis	49.9%

XOLAIR OVER UTILIZATION	UTILIZATION MANAGEMENT OPPORTUNITY
Mbrs with Xolair Claims	0
Mbrs Without Asthma Diagnosis	0
% Without Asthma Diagnosis	0

PROJECTED MEDICAL COST AVOIDANCE *	EMERGENCY ROOM VISITS	HOSPITALIZATIONS
# Est Events	11	3
Est Savings	$4,048	$43,770

EFFICIENCY RATIO	ALL MEMBERS	HIGH-RISK MEMBERS
$ Total Paid	$379,191	$181,182
Current Efficiency Ratio	**47.8%**	

Respiratory high risk defined as an asthma diagnosis claim in past two years and: inhaled corticosteroid, or long acting beta-agonist, or two short acting beta-agonist claims in the quarter. Emergency Room (ER) or hospitalization medical claim for asthma with an additional asthma claim or a COPD hospitalization or ER claim with an additional COPD claim.

ICS = inhaled corticosteroid

* Projected savings are one year annualized using probablities from Arch Intern Med 2002;162:1591, NEJM 2007;356:775, Thorax 2002;57:880 Diagnosis related group (DRG). CMS. June2006 update. Http://www.cms.hhs.gov/medicarefeeforSVCpartsAB/downloads/DRG05.pdf

Gastrointestinal Efficiency Report

Employer 4Q2007

KEY METRICS BY RISK LEVEL	ALL MEMBERS	HIGH-RISK MEMBERS
% Using Proton Pump Inhibitor (PPI) Drugs	6.3%	11.1%
Eligible Members	26,275	
Avg Mbrs/Mth	25,326	
Mbrs Using PPI Drugs	1,644	183
$ Total Paid	$505,149	$56,972
# Claims	3,882	439
$ PMPM (Total Paid)	$6.65	$0.75
$ Claim (Total Paid)	$130.13	$129.78
% Generic	10.8%	10.5%

MEMBER SUMMARY BY RISK FACTOR	HIGH-RISK MEMBERS
High Risk Mbrs	346 1.3%
Mbrs Without PPI Claims	163
Percent Without PPI Claims	47.1%

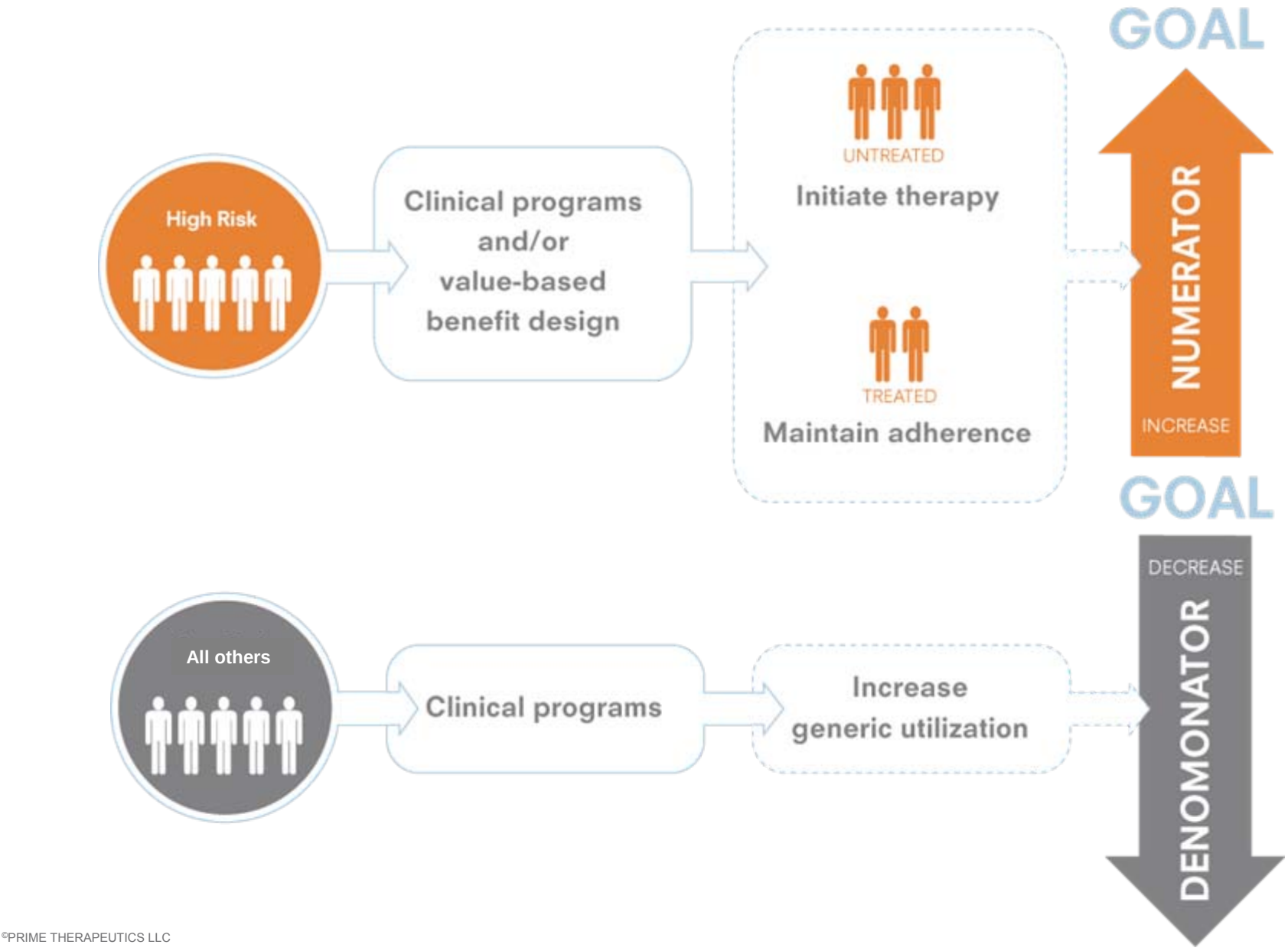
PROJECTED MEDICAL COST AVOIDANCE *	ENDOSCOPY PROCEDURES	GASTROINTESTINAL BLEED HOSPITALIZATIONS
# Est Events	29	0
Est Savings	$15,580	$0

EFFICIENCY RATIO	ALL MEMBERS	HIGH-RISK MEMBERS
$ Total Paid	$505,149	$56,972
Current Efficiency Ratio	**11.3%**	

High risk is defined as an ICD-9 diagnosis coded claim in any field during the past two years for erosive esophagitis (operationalized as esophageal stricuture or reflux esophagitis), or Barrett's esophagitis, or Zollinger-Ellison syndrome, or the combination of gastrointestinal ulcer diagnosis plus a non-steroidal antiinflammatory drug (NSAID) claim in the analysis quarter.

* Projected savings are one year annualized using probabilities from Lancet 2006:367;2086-2100, NEJM 2002;347:2104-2010
* Diagnosis related group (DRG). CMS. June 2006 update. http://www.cms.hhs.gov/medicarefeeforSVCpartsAB/downloads/DRG05.pdf

How are the Efficiency Goals Met?



Efficiency Value Modeling

No Change in Generic Utilization Rate (no pharmacy benefit generic utilization rate optimization)

	Aggregating All 4Q07 Reports	Low (10% High Risk Increase)	Medium (30% High Risk Increase)	High (60% High Risk Increase)
Numerator	$778,907	$825,432	$918,483	$1,058,059
Denominator	$2,561,677	$2,608,202	$2,701,253	$2,840,829
Efficiency Rating	30%	32%	34%	37%
Medical Savings	N/A	$203,000	$789,600	$1,473,000
Pharmacy Savings	N/A	-$46,525	-$139,576	-$279,152

*Medical Savings are from increasing utilization among high risk members by 10% (low), 30% (medium) and 60% (high). The increased utilization among high risk projected to reduce medical events. The medical event costs estimated using CMS DRG costs. Projected annual medical savings is based upon anticipated value-based program pharmacy impact among high risk members.

Efficiency Value Modeling

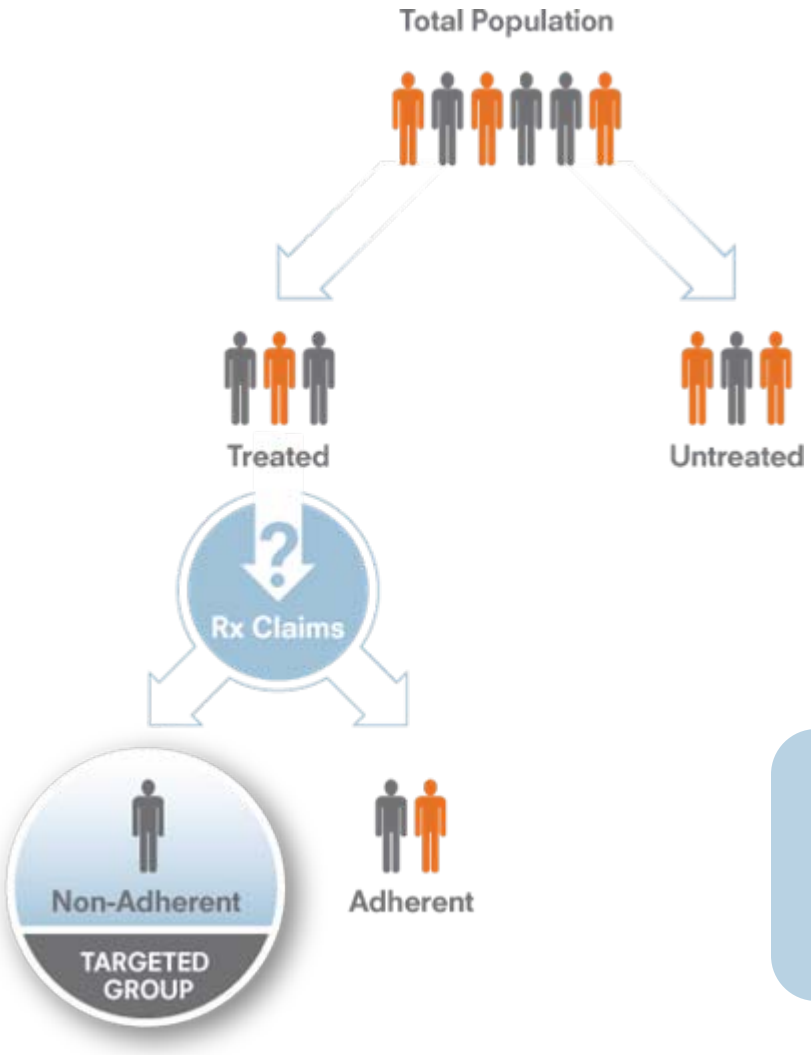
Implementation of pharmacy benefit optimizing generic utilization rate (GUR)

	Aggregating All 4Q07 Reports	Low (10% HR & GUR Increase)	Medium (30% HR & GUR Increase)	High (60% HR & GUR Increase)
Numerator	$778,907	$825,432	$918,483	$1,058,059
Denominator	$2,561,677	$2,400,497	$2,335,251	$2,260,519
Efficiency Rating	30%	34%	39%	47%
Medical Savings*	N/A	$203,000	$789,600	$1,473,000
Pharmacy Savings†	N/A	$161,180	$226,426	$301,158

*Medical Savings are from increasing utilization among high risk members by 10% (low), 30% (medium) and 60% (high). The increased utilization among high risk projected to reduce medical events. The medical event costs estimated using CMS DRG costs. Projected annual medical savings is based upon anticipated value-based program pharmacy impact among high risk members.

† Savings due to GUR rate increases at low, medium, or high rates. High GUR rates are achievable with UM and low cost formulary.

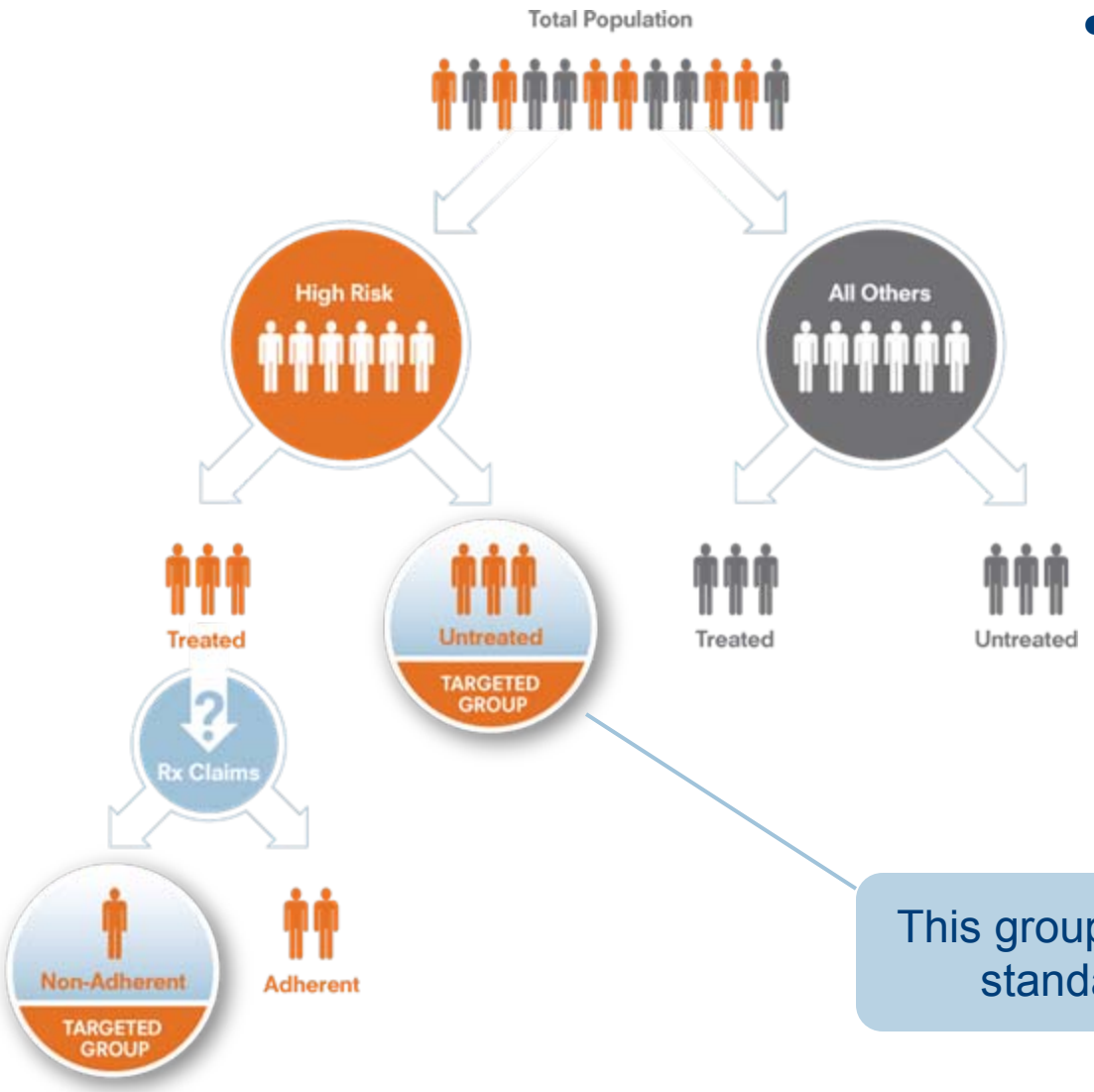
Standard Adherence Approach



- Standard approach looks at all members, regardless of risk
- The most common adherence measure is MPR (medication possession ratio); MPR of less than 80% is considered non-adherent

Standard approach requires members to have at least one pharmacy claim to calculate adherence.

Efficiency Program Adherence Approach



- Efficiency Program adherence report:
  - Focuses on high-risk members
  - Targets non-adherent high-risk members
  - Also targets untreated high-risk members

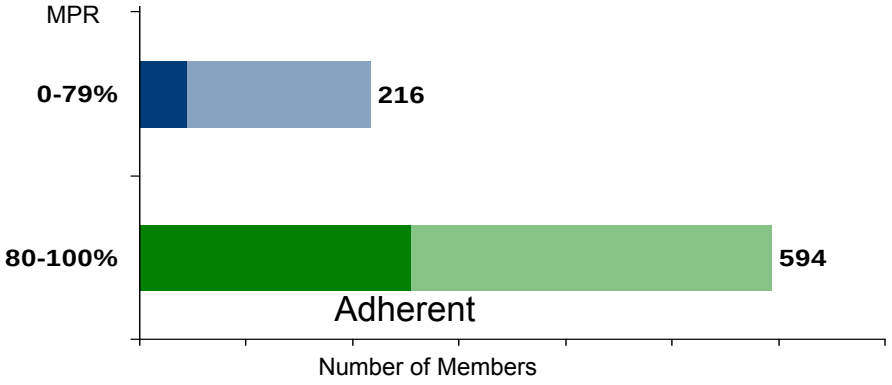
This group is ignored by the standard approach.

Adherence Reporting with Efficiency Program

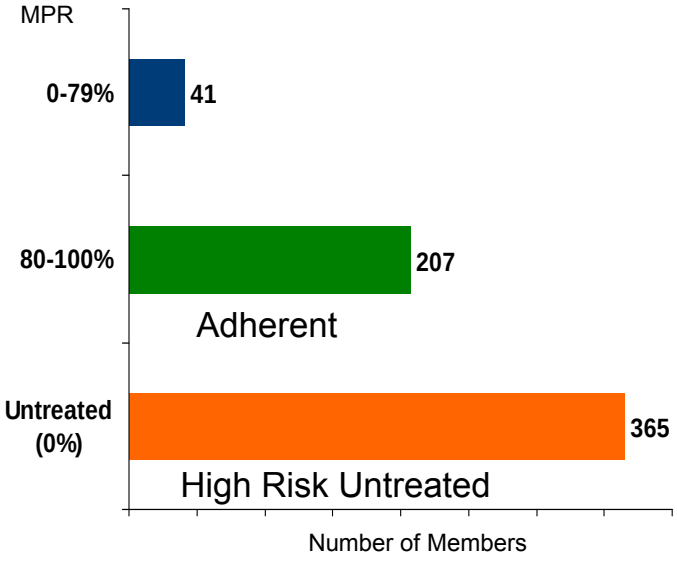
- Standard adherence reporting looks at all members, regardless of risk, and targets non-adherent members
- Efficiency Program adherence report:
  - Focuses on high-risk members
  - Targets non-adherent high-risk members
  - Also targets untreated high-risk members

The Efficiency Program adherence report identifies high-risk members that are untreated, or 0% adherent. These members would have been ignored by standard adherence reporting.

Standard Adherence Report (all utilizers)



Efficiency Program Adherence Report (high-risk members)



*Reports based on data from a 12,000 member employer group

Value-Based Pharmacy Management

- Targeted member interventions
  - High-risk members are coached via letters and Web presentations to encourage them to continue taking their medication or initiate therapy
  - Data on high-risk members sent to plan's disease state management program (if applicable) for further intervention
  - All other members are sent letters that encourage generic utilization to lower costs
- Physician outreach to encourage treatment of untreated high-risk
- Utilization management clinical programs aimed at increasing generic utilization to manage the denominator
  - Step therapy
  - Prior authorization
  - Quantity limits

Case Study: Value-Based Benefit Design

- Set cost-sharing based on value and risk status
- Provide low cost drug therapy to members in select core therapeutic classes
- Prime recommends benefit designs that use lower out-of-pocket costs for all generic drugs and higher out-of-pocket costs for all non-formulary brand-name drugs

Copay per 30-day supply	Current PPO Benefit	Value-based Benefit
Generic	25% coinsurance ($10 min & $25 max)	$4
Formulary brand	25% coinsurance ($20 min & $60 max)	$20
Non-formulary brand	25% coinsurance ($50 min & $100 max)	$60 or 50% coinsurance

Efficiency Cholesterol Lowering Pilot

Method to manage the numerator:

- Of 48,000 lives, 2207 lives (4.8%) were high risk
- Of 2207 high risk lives, 1491 (67.6%) did not have cholesterol lowering therapy
- High risk members not on therapy were sent educational information regarding the benefits of cholesterol lowering medications
- Providers of high risk members not on therapy were sent educational information identifying patients not on therapy
- All non-adherent members and providers were sent educational information regarding the value of medication compliance

Method to manage the denominator:

- Step therapy was implemented to encourage the use of a generic cholesterol lowering agent before a brand

Efficiency Program Pilot Results

Cholesterol Category Summary 2007 vs 2006

Metric	Range (25th Percentile – 75th Percentile)	Bench	Comments
% Ingredient Spend	6.1 – 7.7 – 10.2	9.0%	▪ Total Spend in the cholesterol category is much lower than Prime's Book of Business ▪ Spend is low secondary to a younger population combined with increased use of generics
PMPM Trend	-16.2 – -10.5 – -0.5	-7.7%	▪ Very low trend in category secondary to results from formulary changes and the implementation of cholesterol step therapy
GUR	24.3 – 32.5 – 38.9	27.3%	▪ High generic utilization secondary to programs to drive generic utilization in his category ▪ Generic rate is much higher than Prime Book of business
Inflation	-14.2 – -10.8 – -4.8	-6.2%	▪ Large decrease in inflation secondary to shift to generic utlization and resulting price drops of simvastatin primarily
Utilization Change	5.1 – 12.5 – 14.5	10.1%	▪ Large increase in utilization vs 2006 possibly do to EfficiencyProgram as well as the increase in GUR resulting in lower member out of pocket costs per script improving overall compliance
Mix Effect	-13.6 – -8.2 – -4.8	-6.5%	▪ Very low mix effect secondary to shift to use of generic products resulting from formulary change and step therapy implementation

Current data period: 01/01/2007-12/31/2007 Previous data period 01/01/2006-12/31/2006 Run date: 02/28/2008

Efficiency Program Results

- The member and provider interventions around gaps in care and adherence produced a **13% increase in utilization** (1Q07 vs. 1Q08)
- **Generic utilization for targeted drug category increased 15 percentage points** (1Q07 vs. 1Q08) which is 12 percentage points better than Prime's BOB benchmark for employer groups
- For every 17 high risk members intervened upon an additional 1 initiated therapy for targeted drugs
- The efficiency program goals were met:
  - Increased utilization
  - Decreased costs
- Efficiency ratio improved from 17.0% to 18.5%

Next Step is to implement high risk member value-based benefit and preload statin step-therapy prior authorizations

Predictive Modeling Enhances Value-Based Pharmacy Management

- Understanding of how efficiently your money is spent within key drug classes
- Increase quality of care
  - Identify untreated high-risk members and start them on appropriate therapy for condition
  - Maintain adherence among high-risk users
  - Addressing known safety concerns by identifying any contraindications to therapy
- Maintain affordability of pharmacy benefit
  - Lower costs for high risk members, not all members
  - Apply utilization management programs to optimize generics allowing high risk members to pass through

Summary

- Predictive modeling helps you achieve your pharmacy management goals by:
  - Looking at plan pharmacy spending through the lens of medical data, stratifying members by risk
  - Providing a metric for trend analyses and benchmarks
  - Providing actionable information to make better pharmacy benefit and clinical program decisions
  - Giving you the information to improve the efficiency of your pharmacy dollar

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