



Predictive Modeling for Care & Disease Management

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Overview

- **Predictive Modeling**
- **Stratifying Populations and Identifying High Cost Enrollees**
- **Customer Example**

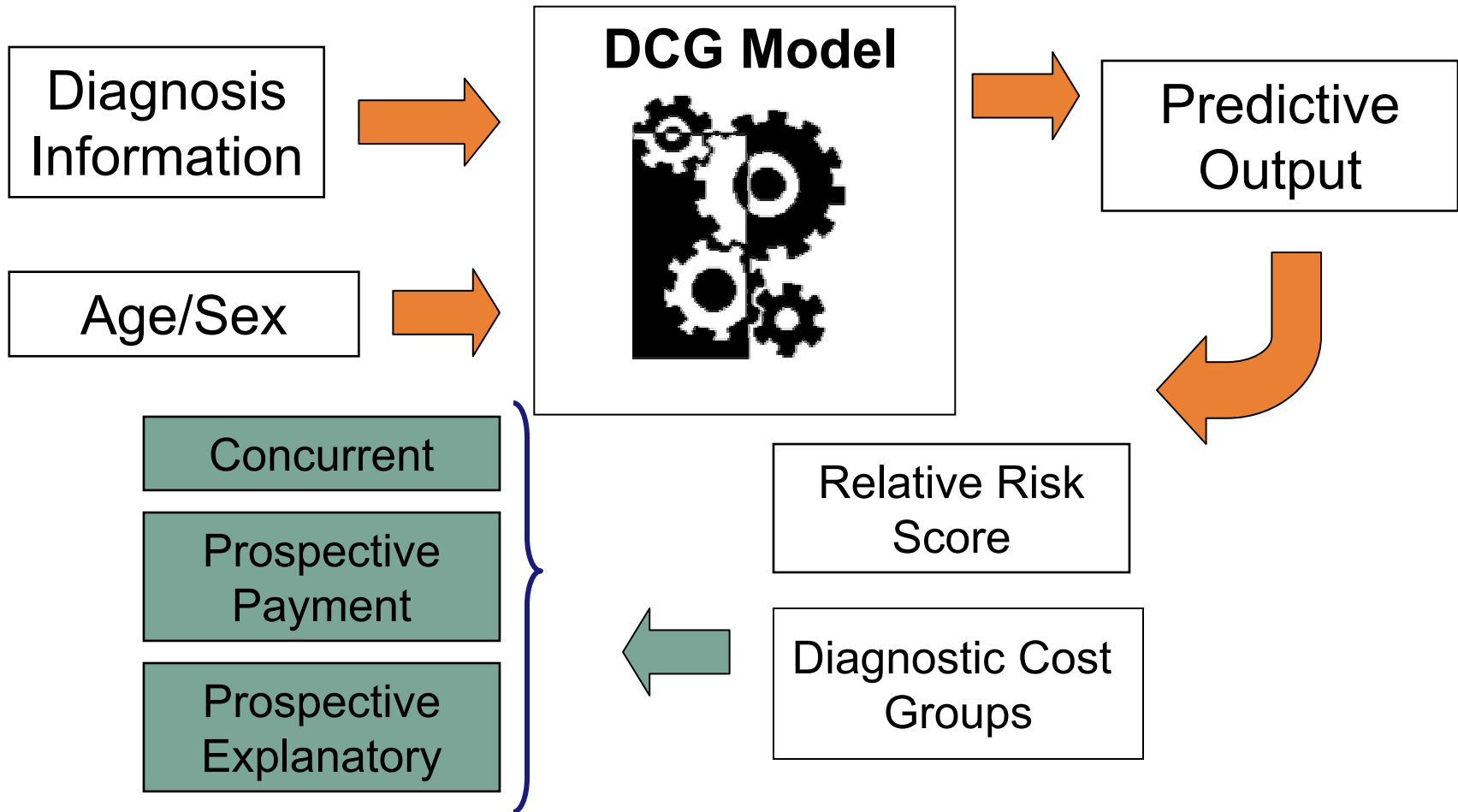


Definition

- **Identification of future cost high-risk patients in order to better intervene, manage risk and set rates**



Predictive Modeling: All - Encounter DCG Model

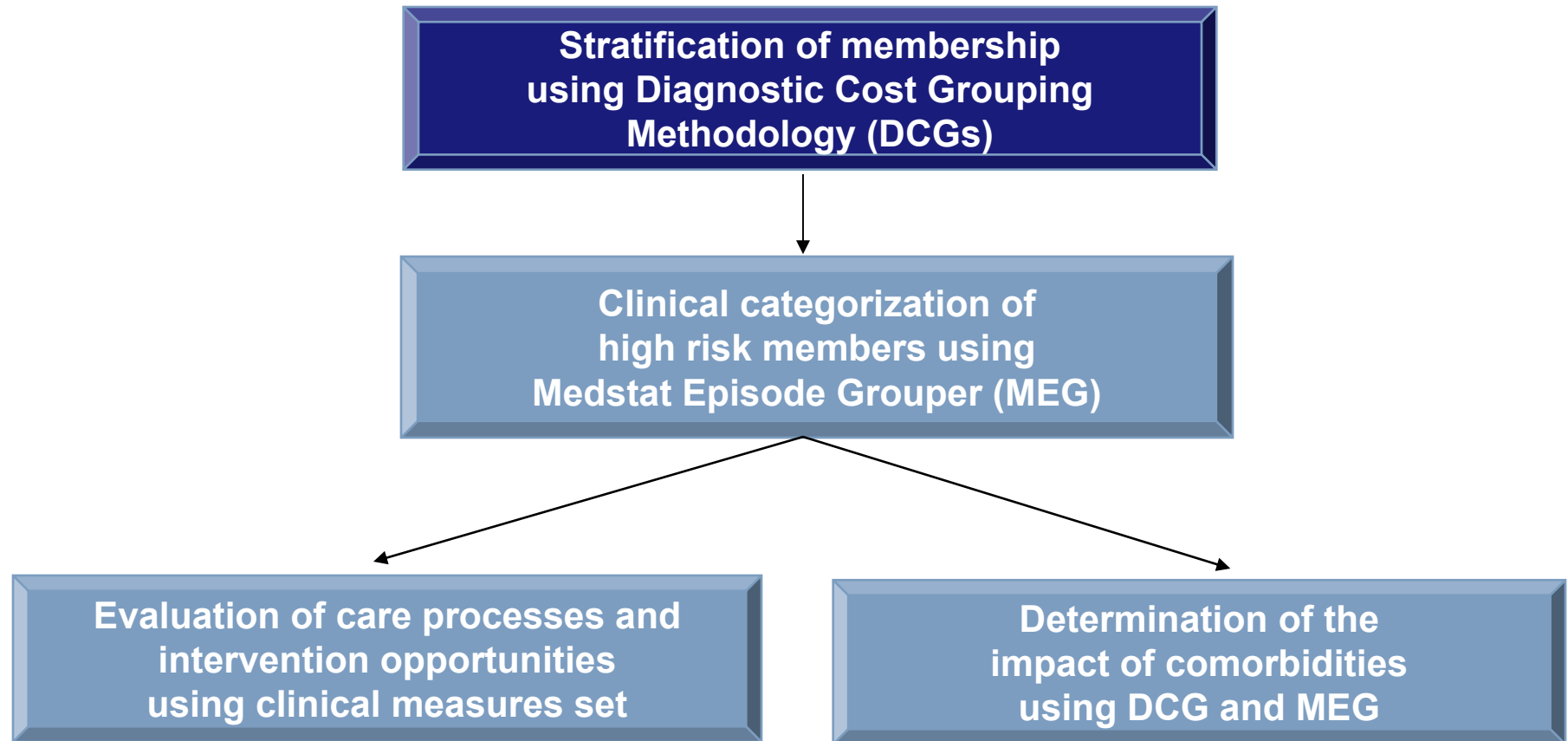


DCG: Calculating the Prospective Relative Risk Score

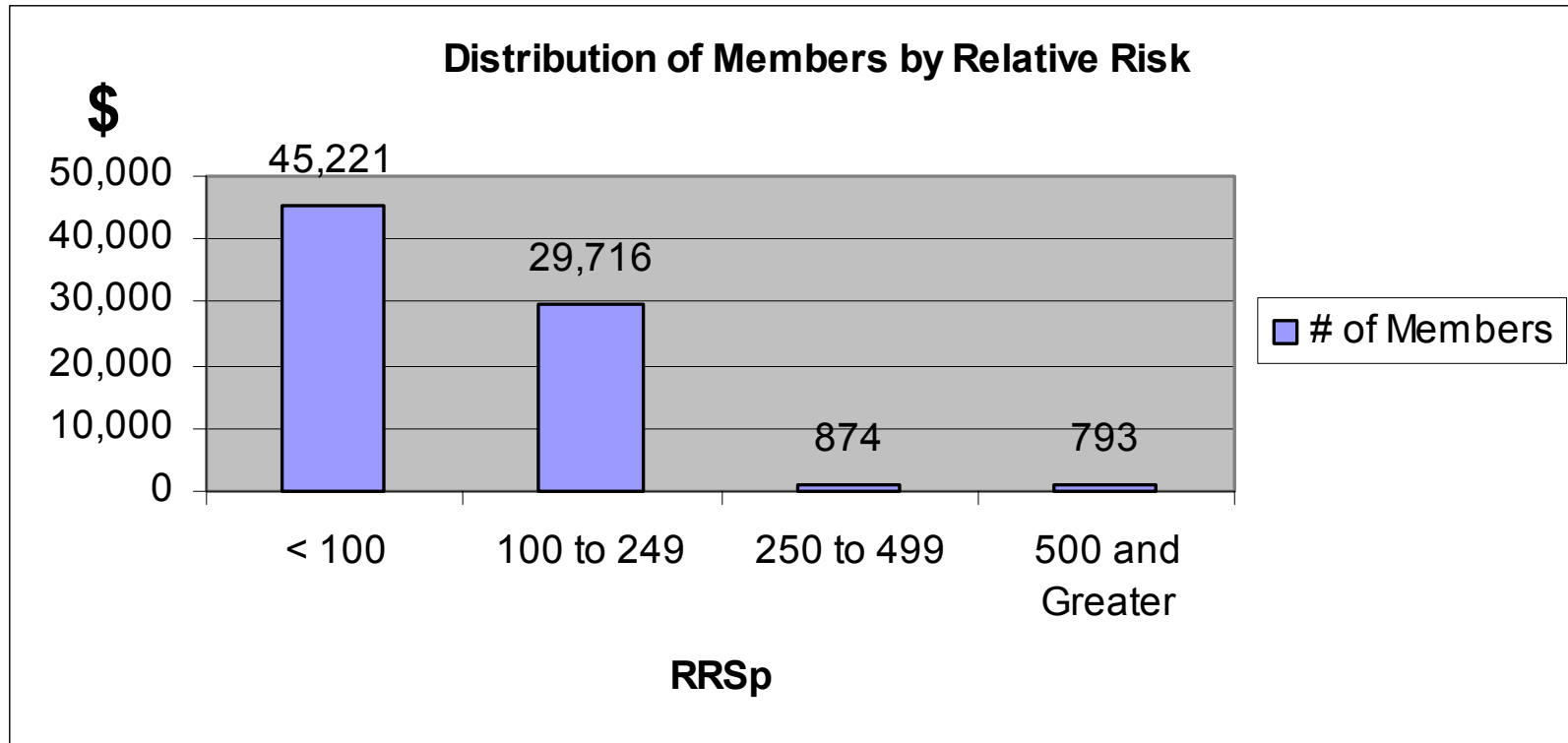
Member ID: 00001
Name: John Smith
Age: 54
Sex: M
Rel Risk Score: 2834

045	54 year old male
	<u>Condition Categories</u>
571	Diabetes with renal manifestation
184	Congestive heart failure
090	Acute myocardial infarction
089	Vascular disease with complication
0	Vascular disease <u>hierarchy</u>
1809	Dialysis status
...
046	Diabetes & congestive heart failure <u>interaction</u>
<hr/>	
2834	Relative Risk Score

Approach to Predictive Modeling and Targeting



Stratifying Population and Identifying High Cost Enrollees





Customer Example

Identifying High-Risk Members Using DCGs and Advantage Suite

Planning and Implementing a Complex Case Management Program

Objectives

- **Proactive Identification of High Risk Members**
 - Operational and Cultural Change
- **Measurement**
 - Early and often



Program Development

- Identify the capacity for case management
- Determine any exclusions from the Program
- Determine the risk score threshold for high risk target population
- Establish the processes of the program
 - Population Assessment
 - Outreach & Engagement
 - Individual Screening & Assessment
 - Care Planning
 - Care Plan Execution
 - Barrier Management & Compliance Monitoring
 - Network Management
 - Cross Referrals
 - Cost Savings



Program Development

- **Other Program Components**

- **Separate Disease Management**

- Asthma
 - CHF
 - COPD
 - Coronary Artery Disease
 - Diabetes

- **High Risk Pregnancy**

- **Outreach to Households with Children <2 years old**

- **Small Populations**

- Hemophilia
 - HIV
 - Sickle Cell



Program Development

- **Program Enhancements**

- **Partnerships for DM, outreach**
- **Financial incentives to PCPs**
 - **Payments above capitation**
- **Implementation of web-based prior authorization**
 - **Increased timeliness of decision-making**
- **Implementation of CareConnect**
 - **Integration across multiple systems**
 - Requires just one log-in for access



Characteristics of the Targeted Population



- **15% total medical and pharmacy costs**
- **5 times the inpatient admission rate of the the Plan**
- **3 times the ER visit rate of the Plan**
- **4 times the prescription rate of the Plan**
- **16% costs associated with Home Care compared to 5% for the Plan**
- **68% have 2+ chronic conditions**
- **Minimum risk score=240**
- **Mean risk score=418 (Plan average is 100)**

Thomson Medstat Solutions

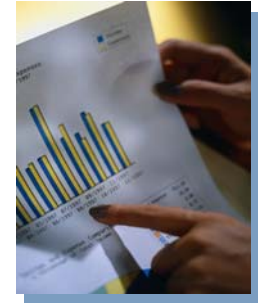


- **Advantage Suite**
 - **Case Identification Using Prospective DCG scores**
 - Delivered Quarterly to Case Management per DCG refresh
 - **Quarterly monitoring and reporting of results**
 - Cost and utilization
- **Expedited Refresh Timetable**
- **Technical Assistance**

Results

- **Targeted Identified Population**

- **N=14,568**
- **Mean risk score=418**
- **Pre/Post 12-month to 12-month comparison**
 - **Total costs decreased \$44.49 pmpm (-4%)**
 - Medical costs decreased \$68.46 pmpm (-7%)
 - Inpatient costs decreased \$60.21 pmpm (-11%)
 - Pharmacy costs increased \$23.98 pmpm (+10%)
 - **Utilization changes**
 - Admissions/1000 decreased 13%
 - ER visits/1000 decreased 3%
 - PCP visits/1000 decreased 2%
 - Prescriptions/1000 increased 3%



Results

- **Quasi-experimental design with comparison group**

- Pre/Post 12-month to 12-month comparison

- Intervention group and comparison group derived from targeted identified population

- **Intervention group**

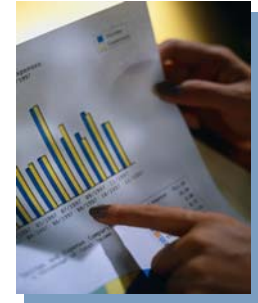
- Mean risk score=436

- Total costs decreased \$73.87 pmpm (-6%)

- Medical costs decreased \$109.69 pmpm (-11%)

- Inpatient costs decreased \$102.69 pmpm (-20%)

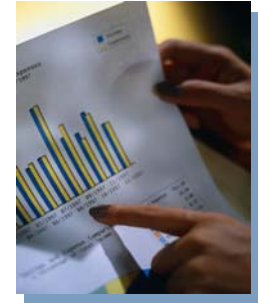
- Pharmacy costs increased \$35.81 pmpm (+13%)



Results

- **Comparison Group**

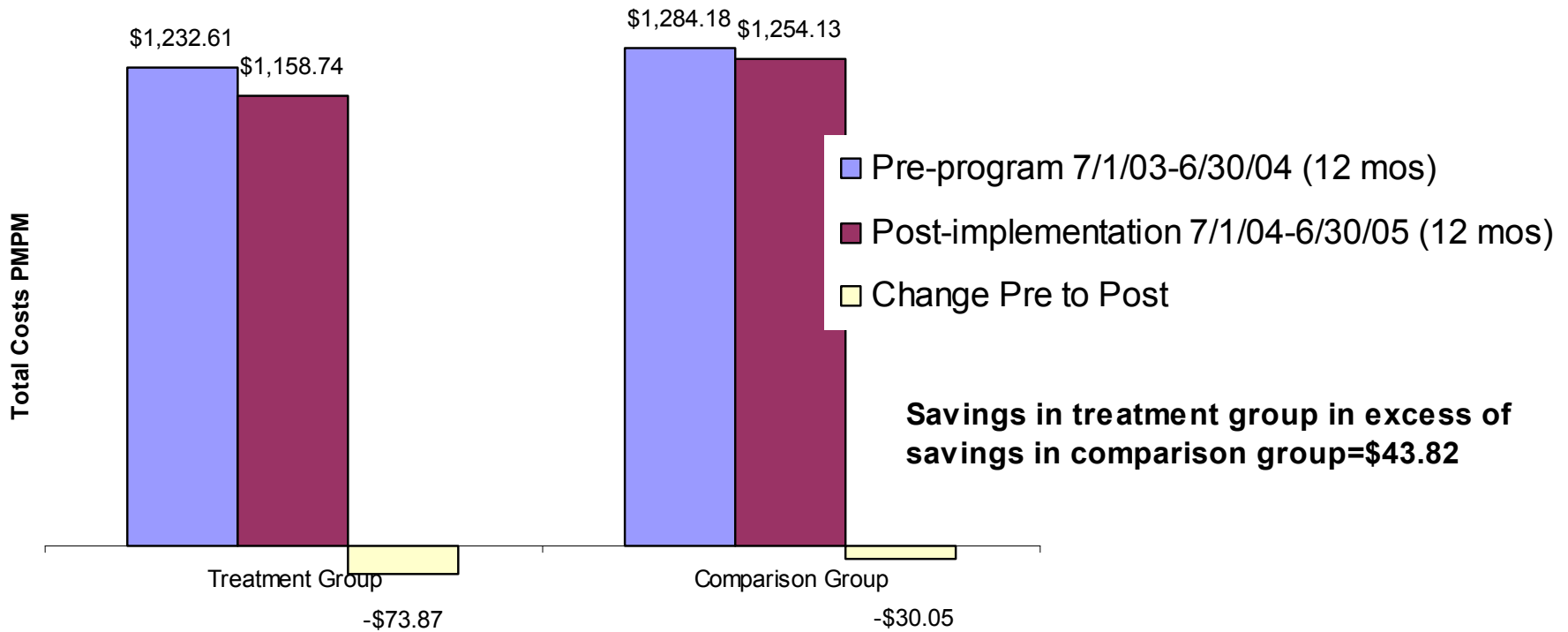
- **Mean risk score=411**
- **Total costs decreased \$30.04 pmpm (-2%)**
 - **Medical costs decreased \$48.02 pmpm (-5%)**
 - **Inpatient costs decreased \$39.23 pmpm (-7%)**
 - **Pharmacy costs increased \$17.98 pmpm (+8%)**



Results

Figure 1: Quasi-experimental design with comparison group

**Complex Case Management Cost Savings
(7/1/03-6/30/04 to 7/1/04-6/30/05)**



Results

Table 1: Targeted High Risk Population

KMHP Targeted Population	Jul 2003-Jun 2004	Jul 2004	Jul 2004-Jun 2005	Variance (Jul 03-Jun 04)-(Jul 04-Jun 05)	% chg
Member Months	154,424	4,190	158,445	4,021	2.6%
IP Admits	8,927	220	7,985	-942	-10.6%
IP Admits/1000	694	630	605	-89	-12.8%
IP Costs	\$88,104,674	1,870,397	\$80,859,553	-\$7,245,121	-8.2%
IP Costs PMPM	\$570.54	\$446.40	\$510.33	-\$60.21	-10.6%
ER Visits	25,289	594	25,216	-73	-0.3%
ER Visits/1000	1,965	1,701	1,910	-55	-2.8%
ER Costs	\$3,668,985	105,122	\$4,807,897	\$1,138,912	31.0%
ER PMPM	\$23.76	\$ 25.09	\$30.34	\$6.59	27.7%
PCP Visits	44,201	1181	44,632	431	1.0%
PCP Visits/1000	3,435	3,382	3,380	-55	-1.6%
Specialists Visits	65,562	1877	63,664	-1,898	-2.9%
Specialists Visits/1000	5,095	5,376	4,822	-273	-5.4%
Specialists Costs	\$7,965,975	177,510	\$7,071,753	-\$894,222	-11.2%
Specialists PMPM	\$51.59	\$42.37	\$44.63	-\$6.95	-13.5%
Homecare Costs	\$11,498,618	282,821	\$8,812,353	-\$2,686,265	-23.4%
Homecare PMPM	\$74.46	\$67.50	\$55.62	-\$18.84	-25.3%
Other Costs	\$46,432,806	\$ 1,326,670.93	\$49,377,421	\$2,944,615	6.3%
Other Costs PMPM	\$300.68	\$ 316.63	\$311.64	\$10.95	3.6%
Total Medical Costs	\$157,671,058	\$3,762,521	\$150,928,977	-\$6,742,081	-4.3%
Total Medical Costs PMPM	\$1,021.03		\$952.56	-\$68.46	-6.7%
Prescriptions	671,747	19,460	706,943	35,196	5.2%
Rx/1000	52,200	55,733	53,541	1,341	2.6%
Rx Costs	\$38,171,138	1,162,158	\$42,963,890	\$4,792,752	12.6%
Rx Costs PMPM	\$247.18	\$277.36	\$271.16	\$23.98	9.7%
Grand Total Costs	\$195,842,196	4,924,679	\$193,892,867	-\$1,949,329	-1.0%
Grand Total Costs PMPM	\$1,268.21	\$ 1,175.34	\$1,223.72	-\$44.49	-3.5%

Lessons Learned

- **Impact on organizational culture**
 - Shift in thinking
 - Disgruntled employees
 - Lack of trust in technology
- **Measurement is never neutral**
 - Cost and utilization quarterly
 - Authorized inpatient admissions monthly
 - Comparison group will never be perfect
- **It's a political world**
 - Department of Public Welfare
 - Finance Dept. vs. Medical Management
 - Independent actuarial consultants



Summary

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