

### New Orleans Business to Business Forum on Healthcare Solutions









### **Embracing Predictive Models**

Advanced Analytics Enhances Care, Customer Service



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# **Uniquely Positioned:** A Catalyst for Change

- Enhance collaboration between insurers and doctors/hospitals, enabling better care
- Move to a value-based payment system and more accountability
- Increase cost and quality transparency
- Improve patient engagement



# **How Advanced Analytics Drive our Business**

- Understanding our members (or purchasers)
  - Employers
  - Insured
  - Illness burden
  - Consumer insights
  - Their demographics

- Understanding the healthcare delivery system
  - Hospitals, doctors, labs, diagnostic centers
  - Practice patterns
  - Quality of care delivered
  - Billing patterns and prices
  - Referral patterns

## **Predictive Modeling-Driven Culture**

- **Definition:** A process that uses artificial intelligence to forecast future outcomes
- Multiple Attributes: Each model comprises a number of predictors, which are variables that are likely to influence future results.



• Action: Our models predict clinical events (such as hospital stays, complaints) days/weeks/years in advance

# **Predictive Modeling Cycle**

**Goal:** Always improve, whether the modeling, action or outcomes.



# **Keys to Success in Predictive Models**

- Data: Able to gather high-quality training data quickly from Enterprise Data Warehouse
  - Enhanced Data Diversity
  - Zero Latency Models
  - Total Number of Variables

### Technology

- Cloud
- Open-source and cutting-edge artificial intelligence algorithms



## **Summary of Predictive Models**

	Risk of Hospitalization	Risk of Emergency Department Visit	Risk of Readmission	Customer Service Complaint Model
Description	Hospitalization in the next 6 months	Emergency department visit in the next 6 months	Readmission in the next 1 month	Complaint to Customer Service in next 1 month
Results	<b>1.5x more likely to</b> <b>predict</b> an unplanned admission than commercial DxCG in high-risk group	<b>1.35x more likely</b> <b>to predict</b> an ED visit than commercial DxCG in high-risk group	Matching a daily auth-derived hospital census file with risk score to notify providers	Between 200 and 350 members identified as high-risk each week
PPV <sup>1</sup> in High Risk Group (Top 1,000)	45%	70%	45%	70%

## Blue Cross' Risk of Hospitalization (ROH) Outperforms Best Commercially Available Model

#### Positive Predictive Value (PPV)



#### **Important Predictors**

- Inpatient hospitalizations in last 2 years
- Radiology services in recent 6 months
- Ambulance services in recent 6 months
- Cardiovascular procedures in recent year
- Diabetes episode in last 2 years
- # of members in family unit

#### **High-Risk Segment Profiles**

- Rural parishes: East Carroll, Union, Vernon, Washington
- Low-income blocks

\*DxCG Risk Model 71 - Rx + all medical predicting prospective likelihood of hospitalization excluding OB and neonate

## Blue Cross' Risk of Emergency Dept. Visit (ROE) Outperforms Best Commercially Available Models

### Positive Predictive Value (PPV)

ROE	*DxCG
Top 1,000	Top 1,000
70%	52%

#### **Important Predictors**

- Emergency Dept. visit in last 2 years
- Inpatient admission in recent 6 months
- Ambulance services in recent 6 months
- Durable medical equipment issued in last 2 years
- Recent antiviral medication to treat flu
- # of members in family unit
- Recent mental health and substance abuse claim

#### **High-Risk Segment Profiles**

- Rural parishes: East Carroll, Union, Vernon, Washington
- Low-income blocks

\*DxCG Risk Model 126 - Rx + all medical predicting prospective likelihood of outpatient Emergency Dept. visit

## **Predictive Models Inform Customer Service**

### Positive Predictive Value (PPV)

Number of Calls Per Week

Тор 50	Тор 350
75-85%	60-70%

#### **Important Predictors**

- Recently complained
- Anger and negative sentiment
- Cumulative out-of-pocket expenses
- Previous number of calls and complaints (related to FCR)
- Silver product metal level (ACA plan membership)
- Someone else calls Customer Service on your behalf



# **Success Stories**

#### Case Study #1

- 41-year-old female
- Diabetes, 3 ER visits
- Outreach by telephonic case manager, who:
  - Notified provider of inability to pay for insulin and co-pays
  - Connected member to financial resources
- Outcome: Member is compliant with medication and able to afford office co-pays

#### Case Study #2

- 63-year-old female
- COPD, anemia,
  18 inpatient admits
- Outreach by telephonic case manager, who:
  - Reviewed claims
  - Submitted incident to Blue Cross
     Fraud Department
  - Supported medication reconciliation
- Outcome: Coordinated care with pain management specialist



#### No further hospitalizations at this time for either member.



### Case Study #3

- 68-year-old retired nurse
- Hypertension, scoliosis, anxiety disorder,
   5 inpatient admits
- Outreach by onsite nurse
- Goals: Pain relief and to be able to return to a quality life and care for her daughter who has multiple sclerosis
- Care coordination: PCP, neurosurgery, pain management services

### Case Study #4

- 56-year-old physician
- Congestive heart failure, hypertension, kidney transplant fail, 11 ER visits, 8 inpatient admits
- Outreach by onsite nurse
- Goals: Compliance with medical management
- Care coordination: Physical therapy services that fit his schedule

#### No further hospitalizations at this time for either member.

### Zero Dollar Co-pay Disease Management Program Increasing Medication Adherence

#### Portion Days Covered (PDC) of Top Prescribed Medications



### Zero Dollar Co-pay Disease Management Program Reducing Healthcare Use and Costs

#### **Healthcare Utilization Per 1,000 Members**

Healthcare	Control Group		ZDC Group			Diff. in	P	
Utilization/1000	Baseline	Evaluation	Δ	Baseline	Evaluation	Δ	Δ	Value
Acute Admits	275	229	-45	267	203	-64	-19	<.0001
Avoidable Admits	24	36	12	49	42	-7	-20	<.0001
30-day Readmissions	28	34	6	33	33	0	-6	<.0001
PCP Office Visits	3329	3145	-184	3412	3642	230	414	<.0001
Special Office Visits	7852	8723	871	7336	7894	558	-313	<.0001

#### Per Member Per Month (PMPM) Expenditures

	Control Group N=249		ZDC Group N=632			Diff. in	<i>P</i> Value	
	Baseline	Evaluation	Δ	Baseline	Evaluation	Δ		
Medical PMPM	1288	1320	32	1317	1112	-205	-237	0.88
Rx PMPM	369	505	136	401	509	108	-28	0.87

## **Next Steps**

- Refine existing models with new tools and techniques
- Use business feedback to improve referrals
- Incorporate new data sources to improve model results
- Leverage cloud for production and significant performance improvements to reduce model run time and development
- Measure improvements in outcomes
  - Reduced emergency department visits
  - Reduced avoidable hospital admissions and readmissions
  - Increased measures for customer satisfaction

### Questions?



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