

Predictive Modeling for Small Group Underwriting

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Improving Your Hand in Care Management

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Objectives

- Demonstrate the value of predictive modeling to the underwriting process
 - Small Group Renewals
 - New business



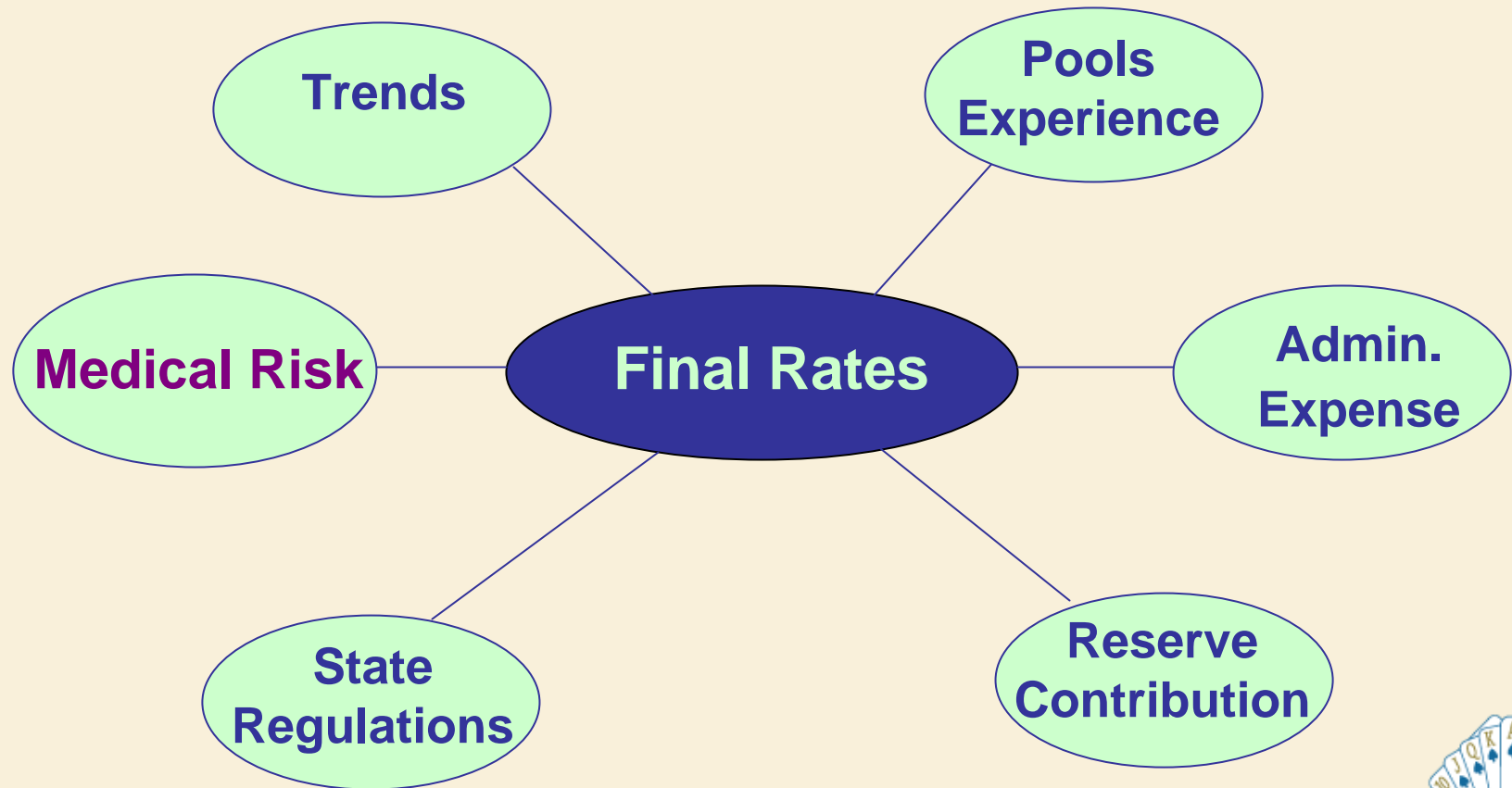
Small Group Renewals

- **The typical objective of the medical underwriting process is to rank accounts by risk and create risk bands**

Account	MU Points
Joe's Plumbing	6,200
Newport Pub	5,312
Providence Floors	3,415
Beth's Auto Body	2,212
Corporate Cleaning Service	1,050
Jamestown Printworks	890
Mark's Catering	756
Gene's Tires	610
Donna's Clam Bar	456
Reliable Taxi	125
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Many Factors Involved in an Account's Final Rates

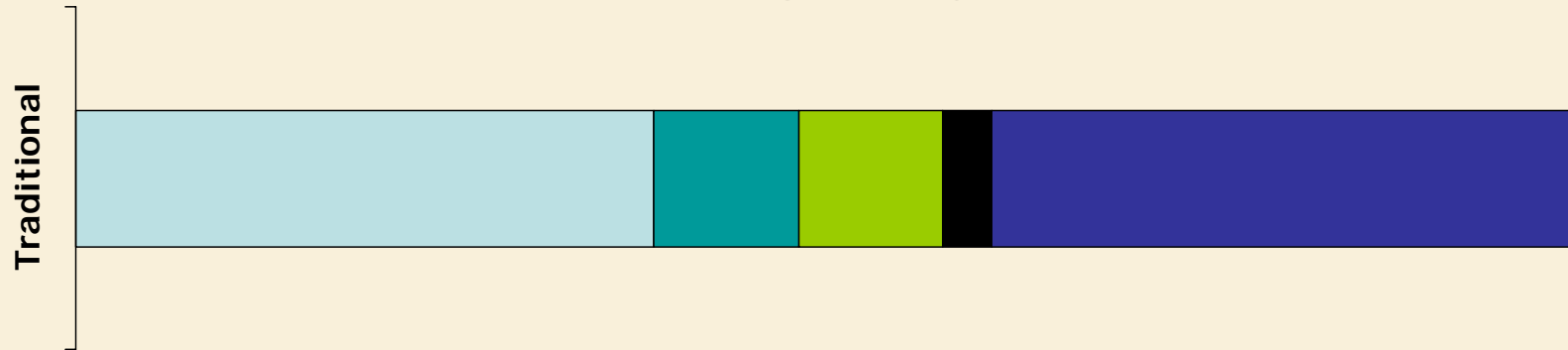


The small group market can be extremely volatile

- Healthy groups have an incentive to shop and may receive reduced initial rates from competitors when they complete a medical application
- Unhealthy groups have a disincentive to shop
- If underwriters can not provide a competitive rate to healthy groups, desirable business is lost and the risk of the remaining pool goes up



Typical Underwriting Time Frame



■ Claims Period ■ Claims lag ■ Manual review ■ Presentation of Rate ■ Rating period



What Can Risk Adjustment Add?

- A new perspective
- Greater efficiency
- Stability and defensible results
- Incorporation of new information (NDC)
- Different answers (?)
- A simpler solution (?)



Risk Factors in the Johns Hopkins Predictive Model



Actuarial Cost Projections

Group	Cases	Local CMI	Mean Total PRI	Mean Rx PRI	% High Risk	% HOS-DOM	% Frail	% Chronic	% Psycho-Social	% Discretionary
A	16	3.26	4.47	6.34	18.75	6.25	12.50	56.25	50	6.25
B	16	0.47	0.98	1.60	0.0	0.0	0.0	12.50	18.75	12.5
C	16	0.90	1.64	3.03	6.25	0.0	0.0	37.50	12.50	6.25
D	15	4.56	6.17	3.34	33.33	33.33	6.67	93.33	20.00	40.00



Small Group Underwriting

- **Traditional MU scores replaced with ACG-based Predictive Model Scores**

Account	MU Points	Mean Total PRI
Joe's Plumbing	6,200	7.0
Newport Pub	5,312	4.9
Providence Floors	3,415	3.4
Beth's Auto Body	2,212	2.0
Corporate Cleaning Service	1,050	1.0
Jamestown	890	.88
Printworks	756	.87
Mark's Catering	610	.79
Gene's Tires	456	1.2
Donna's Clam Bar	125	.12
Reliable Taxi	----	----
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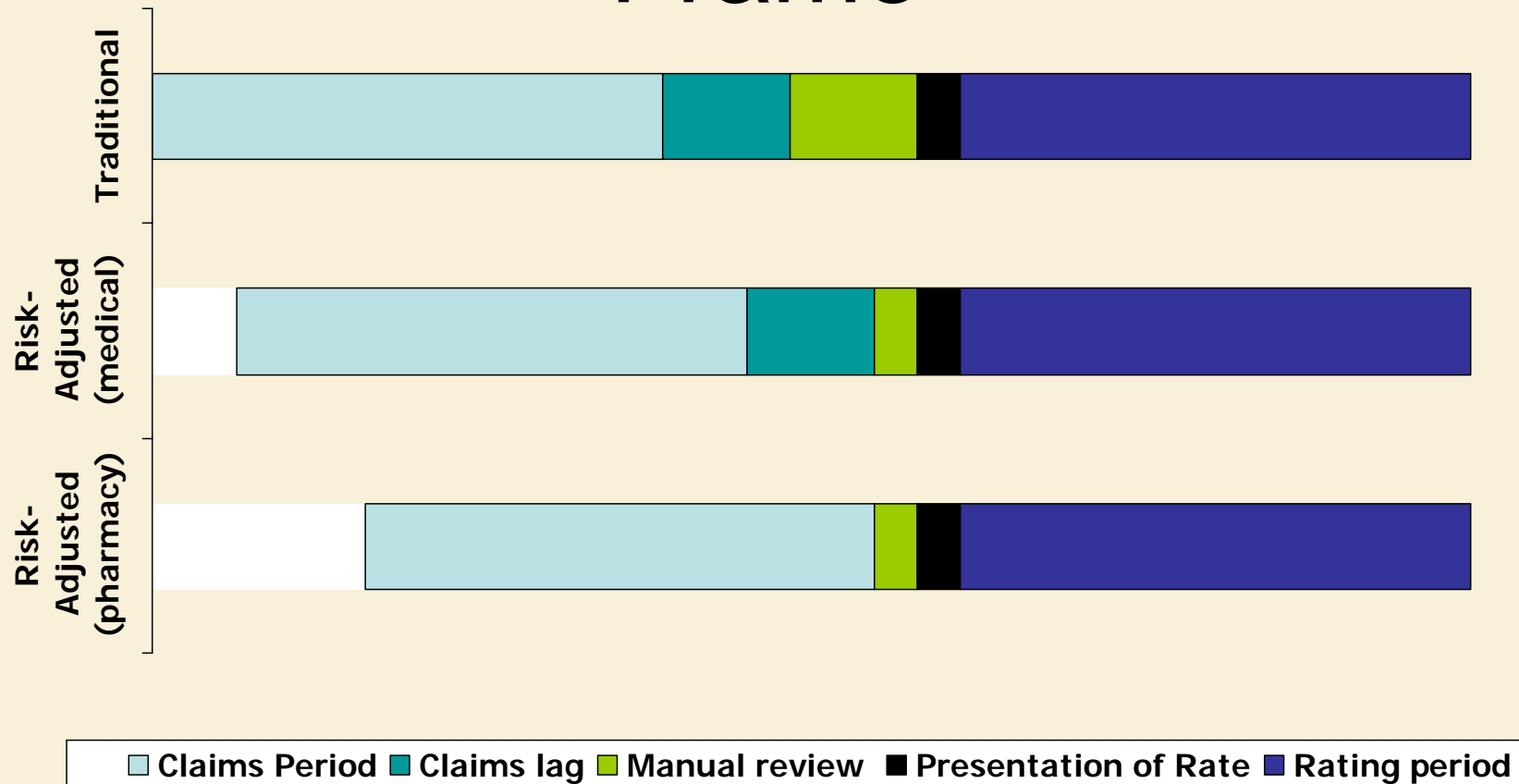


Benefits

- Greater efficiency
 - Reduce medical underwriting effort
 - Reduce lag between analysis period and rating period



Typical Underwriting Time Frame



How Does it Compare to Prior Cost Really?

- To underwrite the second year with a group, there will only be 5 months of experience available (assuming 90 days claims lag)
- If manual review can be reduced, up to 7 months may be available
- Using Rx data to reduce lag, up to 10 months may be available

	5 months prior cost	5 months Rx	7 months Rx	10 months Rx
No truncation	6.59	6.85	7.44	8.25
\$50,000 truncation	10.65	14.22	15.05	16.32

R-squared calculations for a commercial health plan with 400,000 members
Comparing Rx-PM to predict total medical expenditures with a total prior cost model



Benefits, con't

- Reduce underwriting discretion
 - Greater consistency among underwriters
 - Objective, reproducible method
 - More defensible to customers



Benefits, con't

- Greater accuracy
 - Better matches premium to future cost
 - Improvements in R-square of 3-5%
- Competitive renewal rates/Improved customer retention



New Group Underwriting

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Methods for New Group Underwriting

- Request historical medical claims
 - Not feasible in most instances
- Request health risk assessment as part of application process
 - Manual, subjective, error prone
- Request most recent month of pharmacy claims
 - Typically accessible, not unduly burdensome



Understand Population Morbidity

Rx-MG	Group A		Group B	
	N	Observed/1000	N	Observed/1000
ALLx030 Allergy/Immunology / Chronic Inflammatory	6	35.93	8	46.78
ALLx050 Allergy/Immunology / Transplant	1	5.99	0	-
CARx010 Cardiovascular / Chronic Medical	3	17.96	2	11.70
CARx020 Cardiovascular / Congestive Heart Failure	1	5.99	0	-
CARx030 Cardiovascular / High Blood Pressure	28	167.66	1	99.42
CARx040 Cardiovascular / Hyperlipidemia	23	137.72	7	35.09
ENDx010 Endocrine / Bone Disorders	14	83.83	6	35.09
ENDx020 Endocrine / Chronic Medical	9	53.89	6	40.94
ENDx040 Endocrine / Diabetes Without Insulin	5	29.94	7	5.85
ENDx050 Endocrine / Thyroid Disorders	14	83.83	1	46.78
GASx040 Gastrointestinal/Hepatic / Inflammatory Bowel Disease	1	5.99	8	-
GASx060 Gastrointestinal/Hepatic / Peptic Disease	8	47.90	7	40.94



ACG Rx-PM, based only on
pharmacy data, can be used to
compare group risk

	Group A	Group B
Average Risk	1.2	0.9
% High Risk	1.8%	0.0%



Conclusions

- Predictive modeling provides significant value to the small group underwriting renewal process
 - Efficiency
 - Accuracy
 - Objectivity
- As little as six months of claims information can improve over traditional methods of medical underwriting
- Pharmacy data can be used alone, and is especially useful for assessing risk for new business.



Questions?

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