

# Basic Review of ACG Applications

**Dale Fordyce**  
**DST Health Solutions**



# Topics of Discussion

- Analytical Approaches & Reporting
  - Predictive Modeling
    - High Risk Case Identification
    - Care Management
    - Underwriting
  - Health Status Monitoring
  - Performance Assessment
- Data Considerations and Process



# Predictive Modeling for Care Management



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Improving Your Hand in Care Management

May 4-7, 2008 - The Mirage - Las Vegas, Nevada

## Uses

- Predicting the future medical and pharmacy expense of individuals
- Identifying individuals who would benefit from disease, case management and care management interventions
  - Identifying persons for inclusion in consumer-oriented education/outreach programs.
  - Identifying persons for inclusion in multi-disease intensive case-management programs.
  - Effectively target single-focus disease management programs.
  - Providing information useful to individual clinicians for patient-specific quality improvement.
- Developing population health programs



# Example High Risk Patient

Input Data/Patient  
Characteristics

27 year old female

Resource Consumption  
Variables

Total Cost: \$6,073

Medical cost: \$3,877

Pharmacy cost: \$2,196

Ambulatory visits: 7

Hospitalizations: 0

## Example High Risk Patient

ICD9 Codes		ADGs (morbidity view)		EDCs (disease view)	
066.4	West nile fever	4	Time Limited: Major-Primary Infections	INF09	Infections, other
112.9	Candidiasis	8	Likely to Recur: Discrete-Infections	INF02	Fungal infections
292.84 (H)	Drug-induced organic affective syndrome	22	Injuries/Adverse Effects: Major	PSY02 (PM)	Substance use
296.50 (H)	Bipolar affective disorder, depressed	25	Psychosocial:Recurrent or Persistent,Unstable	PSY09 (PM)	Depression
311	Depressive disorder NEC	24	Psychosocial:Recurrent or Persistent,Stable	PSY01 (PM)	Anxiety, neuroses
374.30	Ptosis of eyelid	28	Signs/Symptoms: Major	EYE04	Disorders of the eyelid and lacrimal duct
461.8	Acute sinusitis	2	Time Limited: Minor-Primary Infections	RES07	Sinusitis
477.8	Allergic Rhinitis	5	Allergies	ALL03	Allergic rhinitis
487.1	Influenza	2	Time Limited: Minor-Primary Infections	EAR11	Acute upper respiratory tract infection
493.90	Asthma w/o status	6	Asthma	ALL04 (PM)	Asthma, w/o status asthmaticus
685.1	Pilonidal cyst	29	Discretionary	GSU09	Nonfungal infections of skin and subcutaneous tissue
692.9	Contact dermatitis	1	Time Limited: Minor	SKN02	Dermatitis and eczema
724.5	Backache	7	Likely to Recur: Discrete	MUS14 (PM)	Low back pain
780.6	Fever	26	Signs/Symptoms: Minor	GSI03	Fever
784.0	Headache	26	Signs/Symptoms: Minor	NUR02	Headaches

# Example High Risk Patient

NDC Codes		Rx-MGs
00009332901	clindamycin topical	SKNx010 – Skin / Acne
66530024245	tretinoin topical	SKNx010 – Skin / Acne
00024153502	hexachlorophene topical	SKNx020 - Skin / Acute and Recurrent
00064400006	sodium sulfacetamide topical	SKNx020 - Skin / Acute and Recurrent
51672125303	fluocinonide topical	SKNx020 - Skin / Acute and Recurrent
00088110947	Fexofenadine oral	ALLx010 - Allergy/Immunology / Acute Minor
00555032302	Hydroxyzine oral	ALLx010 - Allergy/Immunology / Acute Minor
00591544205	Prednisone oral	ALLx030 - Allergy/Immunology / Chronic Inflammatory
00065027105	olopatadine ophthalmic	EYEx020 - Eye / Acute Minor: Palliative
49884072601	Doxycycline oral	INFx020 - Infections / Acute Minor
59762332801	Clindamycin oral	INFx020 - Infections / Acute Minor
00069306075	Azithromycin oral	INFx020 - Infections / Acute Minor
63304065705	Cephalexin oral	INFx020 - Infections / Acute Minor
00037024110	azelastine nasal	RESx010 - Respiratory / Acute Minor
00472162716	codeine-promethazine oral	RESx010 - Respiratory / Acute Minor
49502067260	albuterol-ipratropium inhaled	RESx020 - Respiratory / Chronic Medical
00172439018	Albuterol inhaled	RESx040 - Respiratory / Airway Hyperactivity
00186198904	Budesonide inhaled	RESx040 - Respiratory / Airway Hyperactivity
00054465029	acetaminophen-oxycodone oral	GSIx020 - General Signs and Symptoms / Pain

# Example High Risk Patient

NDC Codes		Rx-MGs
00045064165	Topiramate oral	NURx050 - Neurologic / Seizure Disorder
00024540131	Zolpidem oral	PSYx050 - Psychosocial / Acute Minor
00591024010	Lorazepam oral	PSYx030 - Psychosocial / Anxiety
00591578601	Nortriptyline oral	PSYx040 - Psychosocial / Depression
00173073001	Bupropion oral	PSYx040 - Psychosocial / Depression
50458030206	Risperidone oral	PSYx060 - Psychosocial / Chronic Unstable
59148000813	Aripiprazole oral	PSYx060 - Psychosocial / Chronic Unstable

# Example High Risk Patient

Input Data/Patient Characteristics	Resource Consumption Variables	Descriptive Information
27 year old female	Total Cost: <u>\$6,073</u> Medical cost: <u>\$3,877</u> Pharmacy cost: <u>\$2,196</u> Ambulatory visits: <u>7</u> Hospitalizations: <u>0</u>	Total Cost Band: <u>76-90</u> Pharmacy Cost Band: <u>91-93</u> HOSDOM Count: <u>2</u> Chronic Condition Count: <u>3</u>
Concurrent Assessment	Predictive Assessment (pharmacy)	Predictive Assessment (diagnosis)
ACG: <u>5060</u> (10+ ADGs, 3 Major) Relative weight: <u>14.31</u>  RUB: <u>5</u> (Very High Morbidity)	ACG PM Prob Total Cost: <u>37%</u> Relative risk for Total Cost: <u>5.36</u> Predicted Total Cost: <u>\$11,722</u> ACG PM Prob Rx Cost: <u>88%</u> Relative risk for Rx Cost: <u>10.75</u> Predicted Pharmacy Cost: <u>\$4,838</u>	ACG PM Prob Total Cost: <u>69%</u> Relative risk for Total Cost: <u>9.56</u> Predicted Total Cost: <u>\$20,908</u> ACG PM Prob Rx Cost: <u>78%</u> Relative risk for Rx Cost: <u>6.90</u> Predicted Pharmacy Cost: <u>\$3,105</u>

# Calculating Predicted Expense

- What's needed?
  - Rescaled Total (and/or Rx) Cost Resource Index
  - PMPY Average Cost
- Individual Predicted Expense = Rescaled Total Cost Resource Index  $\times$  PMPY Average Cost
- Predicted expense is best suited to ranges as opposed to a 'fixed' dollar amount
  - For example, \$10k – \$15k; \$16k – 25\$k, etc.



# Predicting Future Medical Cost

Analyze -> Patient List -> filter on those with High Total Cost Probability

Johns Hopkins ACG System 8.1

File Edit View Analyze Tools Help

t.acgd Patients

Patient Details for t.acgd

Patients Report Options

Patient Id	Age	Sex	ACG Cd	Pharm Cost	Total Cost	Hospital Dom...	Chronic Cond...	Probability High Total...	Rescaled Total Cost ...	Line
UZTTZYVWT...	55	M	4100	452.27	1,155.82	1	4	0.82	12.82	COMP
VSVUXRUZZY...	54	M	4430	999.16	6,056.37	1	3	0.77	11.04	COMP
URUVTTQUT...	54	M	4430	4,586.68	6,794.70	0	1	0.88	17.58	COMP
UZRRRUQUT...	48	M	4430	0.00	8,628.90	2	2	0.77	10.54	COMP
VTVSVYVWT...	60	F	5040	4,558.80	12,369.27	0	6	0.77	11.14	COMP
UZRUZYRRZ...	60	F	4930	7,210.38	12,928.52	2	4	0.77	10.94	COMP
IIZI IIVTRI IY...	63	F	4930	6,586.18	15,735.80	1	5	0.88	17.73	COMP



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## Predicting Future Medical Cost Cont.

Analyze -> Actuarial Cost Projections

Johns Hopkins ACG System 8.1

File Edit View Analyze Tools Help

sample.acgd Patients Actuarial Projections

Actuarial Cost Projections for sample.acgd

Overall	Line of Business	Company	Product	Employer Id	Benefit Plan	Health System	Age Band	Report Options					
Line of Business	# Cases	National CMI	Local CMI	Mean Total PRI	Mean Rx PRI	% High Risk	% HOSDOM	% Frail	% Chronic	% Psychosocial	% Discretionary	Age/Sex Relative Risk	
COMMERCIAL_A	47	3.11	4.55	2.72	2.54	8.51	2.13	12.77	76.60	55.32	46.81	0.60	
COMMERCIAL_B	5,704	0.83	1.09	1.04	0.98	1.91	0.91	1.05	23.65	15.25	8.43	0.98	
COMMERCIAL_C	2,246	0.93	1.24	1.20	1.25	2.58	0.98	0.98	30.32	18.03	9.13	1.08	
COMMERCIAL_D	11,786	0.72	0.90	0.94	0.96	1.57	0.63	0.92	21.02	15.23	8.64	1.00	

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# Risk Stratify DM Populations

		Number of Cases			Relative Risk			
		Probability Score Category			Probability Score Category			
EDC Disease Category	Number of unique claimants w/ disease	≥ 0.4	≥ 0.6	≥ 0.8	<0.4	≥ 0.4	≥ 0.6	≥ 0.8
Arthritis	2805	184	76	15	1.98	7.23	8.73	10.98
Asthma	4497	196	89	27	1.45	7.49	8.91	11.21
Diabetes	2951	330	164	55	2.59	9.23	10.91	13.73
Hypertension	8908	356	168	57	1.86	8.67	10.39	13.32
Ischemic Heart Disease	2241	231	108	44	2.95	9.23	10.71	13.32
Congestive Heart Failure	313	92	47	26	5.05	11.78	13.69	15.73
Hyperlipidemia	7252	234	96	29	1.70	7.74	9.33	11.83
Low Back Pain	7669	357	178	54	1.66	7.48	8.86	11.29
Depression	3933	335	156	45	1.96	7.35	8.83	11.11
Chronic Renal Failure	114	71	46	27	13.42	19.24	20.54	22.77
COPD	1068	105	57	21	2.55	8.85	9.56	11.98

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