

# Selected Analytic Findings: Variability in Resource Use, Attribution, and Episode Denominators

Asthma, CHF, Diabetes, Low Back Pain, and  
Colon Cancer

QASC Episodes Workgroup Meeting:  
February 5, 2010

# General Project Updates

- Rapid testing and validation of measures
  - Focus on measures likely to be included in NQF “call for measures”
- Continuous feedback loop with physician workgroups, TAC, and QASC to refine measures
- CMS constructing RFP to develop Episode Logic for Medicare Physician Resource Use Measurement
  - Discussions underway regarding possible involvement of ABMS and Brookings staff
- National Quality Forum “Call for Measures” expected in July 2010
- Discussions underway with organizations that may perform long-term maintenance on measure set

# Overview of Measure Testing and Validation Process

- Size of, and attrition from episode denominator
- “Level 1” analyses of resource use
  - Total episode spending by type of service
  - Top 20 “condition-related” & “non-condition-related” E&M, procedures, imaging, tests, inpatient admissions (by ICD-9 and DRG) and drugs, by service counts and dollar volume
- Test proposed attribution logic
  - Examine variability in per-episode resource use at individual provider level (as relevant) and by provider specialty
- “Level 2” analyses of resource use
  - Incorporate risk adjustment
  - Identify specific drivers of resource use variation
  - Analyze observed variability across states, regions, provider specialties

*\*\*Note: analytic results are preliminary and subject to change*

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# Initial Findings from Measure Testing and Validation

- Observed resource use generally meets ‘face validity’ thresholds for physician workgroups
  - Expectations among workgroups for imaging and outpatient facility costs in episodes may have outstripped reality
- For several episodes (e.g., AMI, CHF, COPD), the Marketscan database contains only small samples
  - Continuous Medical and Rx coverage requirements have large impact on attrition from denominator; limiting requirement to the period of measurement may meaningfully increase some episodes’ sample size
- Marketscan data permit only limited testing of attribution models (due to sample size & missing provider IDs)
- Improving methods for identifying “cost-driving” services using C3 episodes may require additional resources

# Identifying Variability in Asthma- and CHF-related Resource Use

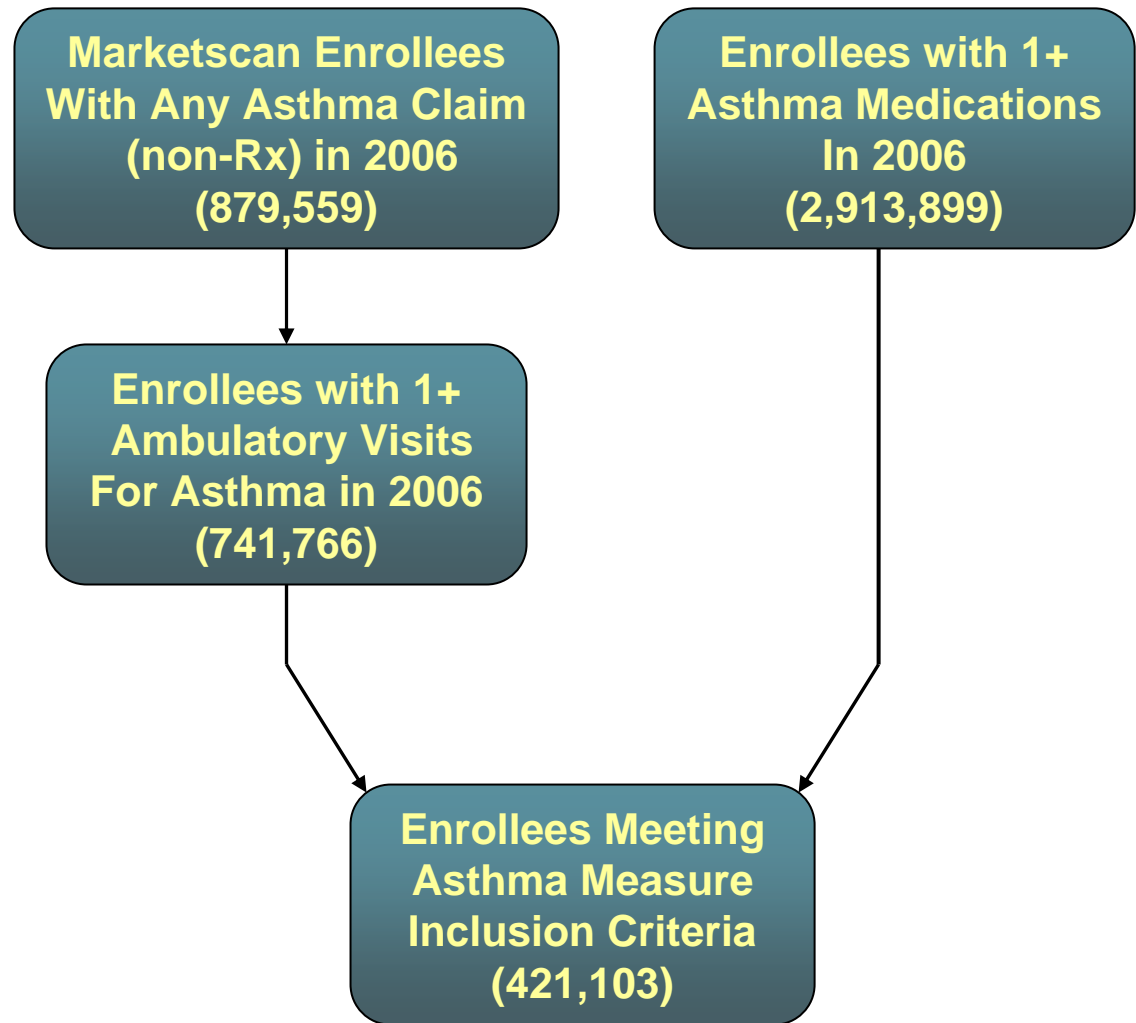
- Analyses intended to identify trends in the observed variability in resource use for episodes of CHF management and asthma management
- Variability measured at the following levels:
  - Region
  - State
  - Specialty
  - Individual Provider

# Asthma

- Asthma Management Over One Year: Drugs, E&M care, testing, procedures, and other services provided in the treatment or management among patients with prevalent asthma over a 12-month period
  - Preliminary efforts to assess observed variability across asthma episodes and identify cost-driving services

## Asthma One-Year Measure Denominator

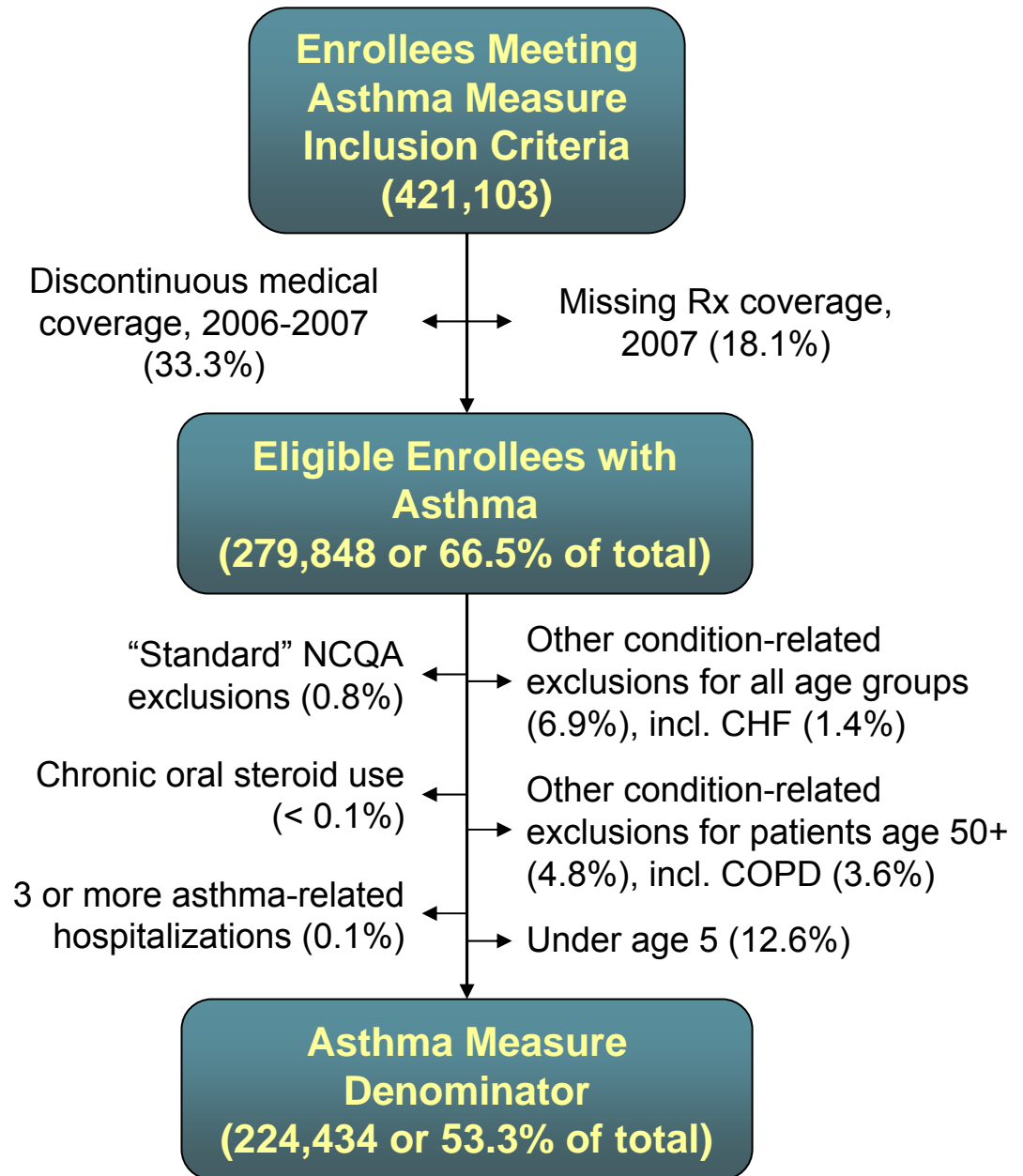
- **At least one** ambulatory visit with Dx of 493.x in 2006
- At least one asthma medication (see p.4, Table ASTHMA-B) in 2006
- Identification period: Jan. 1, 2006 – Dec. 31, 2006
- Measurement window: Jan. 1, 2007 – Dec. 31, 2007



\* If requirement were reduced to 30+ days' separation, an additional ~15,000-25,000 episodes would meet measure inclusion criteria.

## Asthma One-Year Measure Denominator

- **At least one** ambulatory visit with Dx of 493.x in 2006
- At least one asthma medication (see p.4, Table ASTHMA-B) in 2006
- Identification period: Jan. 1, 2006 – Dec. 31, 2006
- Measurement window: Jan. 1, 2007 – Dec. 31, 2007
- Note: exclusions are not additive (double-counting occurs often)



# Asthma: Resource Use by Type of Service vs. Overall Mean, by State

Description	Overall	TX	GA	CA	TN	SC	IL	OH	AL	FL	MI
<b>N</b>	<b>45,864</b>	<b>8,654</b>	<b>4,834</b>	<b>4,553</b>	<b>2,354</b>	<b>2,057</b>	<b>1,330</b>	<b>1,252</b>	<b>1,235</b>	<b>1,189</b>	<b>1,157</b>
Inpatient Facility Charge	\$185	1.01	1.04	0.75	1.05	1.13	0.88	1.36	1.36	0.93	0.60
Durable Medical Equipment	\$9	1.06	0.79	1.21	1.01	1.27	0.91	1.07	1.33	0.96	0.99
OP Facility Charges	\$337	1.08	0.97	0.76	0.81	0.94	0.94	1.43	1.28	0.81	1.03
Imaging	\$48	0.86	1.04	0.83	1.79	0.93	1.06	0.69	1.65	1.16	0.59
Evaluation and Management	\$350	0.83	1.06	1.03	1.20	1.49	1.07	0.93	1.10	1.11	0.99
Other Services	\$51	0.71	2.74	1.48	0.44	1.00	0.21	1.18	0.87	0.32	0.48
Procedures	\$43	1.11	1.34	0.63	1.14	1.20	0.74	0.47	1.36	1.26	0.66
Tests	\$91	0.99	1.01	0.94	1.15	1.25	0.87	0.75	1.06	1.30	0.79
Unclassified	\$7	3.98	0.14	0.40	0.11	0.56	0.22	1.31	0.28	0.41	0.27
Drug Charges	\$1,099	0.94	0.94	0.89	1.37	0.97	1.00	0.96	1.05	1.05	0.69
<b>Sum of charges</b>	<b>\$2,221</b>	<b>0.96</b>	<b>1.02</b>	<b>0.89</b>	<b>1.20</b>	<b>1.08</b>	<b>0.96</b>	<b>1.04</b>	<b>1.13</b>	<b>1.01</b>	<b>0.78</b>

# Asthma: Resource Use by Type of Service vs. Overall Mean, by Specialty\*

- Results presented for high-volume specialties: 1-5

Description	Overall	Family Practice	Allergy & Immunology	Internal Medicine	Pediatrics	Multi-Specialty Group
<b>N</b>	<b>45,864</b>	<b>13,493</b>	<b>8,850</b>	<b>6,915</b>	<b>5,598</b>	<b>3,721</b>
Inpatient Facility Charge	\$185	0.90	0.51	1.21	0.67	0.82
Durable Medical Equipment	\$9	1.07	0.82	1.13	1.05	1.20
OP Facility Charges	\$337	0.94	0.63	1.15	0.73	0.87
Imaging	\$48	1.02	1.02	1.35	0.49	0.83
Evaluation and Management	\$350	0.80	1.54	0.96	0.86	0.94
Other Services	\$51	0.53	1.87	0.65	0.42	1.36
Procedures	\$43	0.82	1.17	1.34	0.59	0.53
Tests	\$91	0.71	1.77	0.97	0.81	0.90
Unclassified	\$7	0.20	3.86	0.26	0.36	0.22
Drug Charges	\$1,099	0.89	1.32	1.10	0.66	0.85
<b>Sum of charges</b>	<b>\$2,221</b>	<b>0.87</b>	<b>1.21</b>	<b>1.08</b>	<b>0.70</b>	<b>0.87</b>

\* Individual episodes may be attributed to as many as three providers, and so the resource use associated with any given episode may be reflected in the results for up to three provider specialties; family physicians will be the subject of further analysis

# Asthma-Specific Services and Costs, Top 20% vs. Bottom 80% of Family Physicians

Description	Costs per Episode	% of Total	Services*		Top 20% / Bottom 80%	
			Bottom 80%	Top 20%	Services*	Costs*
Drug Costs	\$946.83	49.3%	9.85	12.26	1.24	1.45
OP Facility	\$315.44	16.4%	1.10	3.38	3.07	5.28
E&M	\$285.01	14.9%	3.42	5.09	1.49	1.99
IP Facility	\$176.11	9.2%	0.01	0.09	8.58	11.09
Tests	\$71.29	3.7%	1.64	2.32	1.41	1.42
Imaging	\$50.51	2.6%	0.61	0.99	1.62	1.56
Procedures	\$36.76	1.9%	0.41	0.66	1.60	2.52
Other	\$24.93	1.3%	0.42	0.59	1.40	5.67
DME	\$10.28	0.5%	0.23	0.26	1.16	1.93
Unclassified	\$1.86	0.1%	0.05	0.05	0.99	1.06
<b>Total</b>	<b>\$1,919.01</b>	<b>100.0%</b>	<b>35.00</b>	<b>46.27</b>	<b>1.32</b>	<b>1.58</b>

# Asthma: Cost-Drivers, OP Facility

CPT	Description	Costs per Episode	% of Total	Services per Episode		Top 20% / Bottom 80% Ratio
				Bottom 80%	Top 20%	
.	(blank)	\$181.79	57.6%	0.39	1.82	4.62
74160	Computed tomography, abdomen; with contrast material	\$8.81	2.8%	0.01	0.02	2.82
43239	Upper gastrointestinal endoscopy including esophagoscopy	\$8.31	2.6%	0.01	0.02	1.68
71020	Radiologic examination, chest, two views, frontal and lateral	\$7.61	2.4%	0.06	0.11	1.72
99284	Emergency department visit for the evaluation and management of a patient with a minor injury or illness	\$7.29	2.3%	0.01	0.03	1.91
99283	Emergency department visit for the evaluation and management of a patient with a moderate injury or illness	\$6.44	2.0%	0.02	0.06	3.54
71260	Computed tomography, thorax; with contrast material	\$5.79	1.8%	0.01	0.01	1.92
74150	Computed tomography, abdomen; without contrast material	\$5.25	1.7%	0.01	0.01	1.92
85025	Blood count; complete (CBC), automated (Hgb, Hct, platelets)	\$4.71	1.5%	0.10	0.17	1.65
70486	Computed tomography, maxillofacial area; without contrast material	\$4.16	1.3%	0.01	0.01	1.89
74170	Computed tomography, abdomen; without contrast material	\$3.59	1.1%	0.00	0.01	2.27
94640	Pressurized or nonpressurized inhalation treatment with short acting beta2 agonist	\$3.40	1.1%	0.03	0.06	1.72
47563	Laparoscopy, surgical; cholecystectomy with cholangiogram	\$3.14	1.0%	0.00	0.00	1.43
99285	Emergency department visit for the evaluation and management of a patient with a major injury or illness	\$3.13	1.0%	0.00	0.01	5.85
94060	Bronchodilation responsiveness, spirometry as in 94030	\$1.99	0.6%	0.01	0.02	2.37
43235	Upper gastrointestinal endoscopy including esophagoscopy and small bowel intubation	\$1.83	0.6%	0.00	0.00	2.15
76700	Ultrasound, abdominal, real time with image documentation	\$1.82	0.6%	0.01	0.01	1.48
71010	Radiologic examination, chest; single view, frontal	\$1.56	0.5%	0.01	0.02	1.73
94010	Spirometry, including graphic record, total and time volume	\$1.56	0.5%	0.01	0.02	1.58
95004	Percutaneous tests (scratch, puncture, prick) with or without antigen	\$1.45	0.5%	0.00	0.00	1.53

- **Note: 16% of total episode costs overall**

# Asthma: Cost-Drivers, E&M Costs

CPT	Description	Costs per Episode	% of Total	Services per Episode		Top 20% / Bottom 80% Ratio
				Bottom 80%	Top 20%	
99213	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of low complexity.	\$97.26	34.1%	1.04	1.16	1.12
99214	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$63.34	22.2%	0.66	0.72	1.09
95165	Professional services for the supervision of preparation of a patient for allergen immunotherapy.	\$33.47	11.7%	0.14	0.27	1.97
95117	Professional services for allergen immunotherapy (immunization).	\$19.88	7.0%	0.75	1.27	1.68
95115	Professional services for allergen immunotherapy (immunization).	\$7.26	2.5%	0.38	0.77	2.03
99215	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$6.94	2.4%	0.04	0.05	1.24
99284	Emergency department visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$5.34	1.9%	0.02	0.06	2.83
99203	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$5.28	1.9%	0.05	0.05	0.88
92014	Ophthalmological services: medical examination and ophthalmic history.	\$4.18	1.5%	0.05	0.03	0.69
99244	Office consultation for a new or established patient.	\$3.80	1.3%	0.02	0.02	1.29
99204	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$3.69	1.3%	0.02	0.02	0.96
99212	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of low complexity.	\$3.16	1.1%	0.06	0.10	1.56
99285	Emergency department visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$2.85	1.0%	0.01	0.03	4.44
99222	Initial hospital care, per day, for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$2.49	0.9%	0.00	0.03	17.16
99245	Office consultation for a new or established patient.	\$2.20	0.8%	0.01	0.02	2.47
92004	Ophthalmological services: medical examination and ophthalmic history.	\$2.18	0.8%	0.02	0.02	0.96
99283	Emergency department visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$2.06	0.7%	0.02	0.03	1.66
92012	Ophthalmological services: medical examination and ophthalmic history.	\$2.02	0.7%	0.03	0.03	1.04
99232	Subsequent hospital care, per day, for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$1.36	0.5%	0.01	0.07	12.57
99202	Office or other outpatient visit for the evaluation and management of the patient, which requires a detailed history and physical examination and medical decision making of moderate complexity.	\$1.34	0.5%	0.02	0.02	1.21

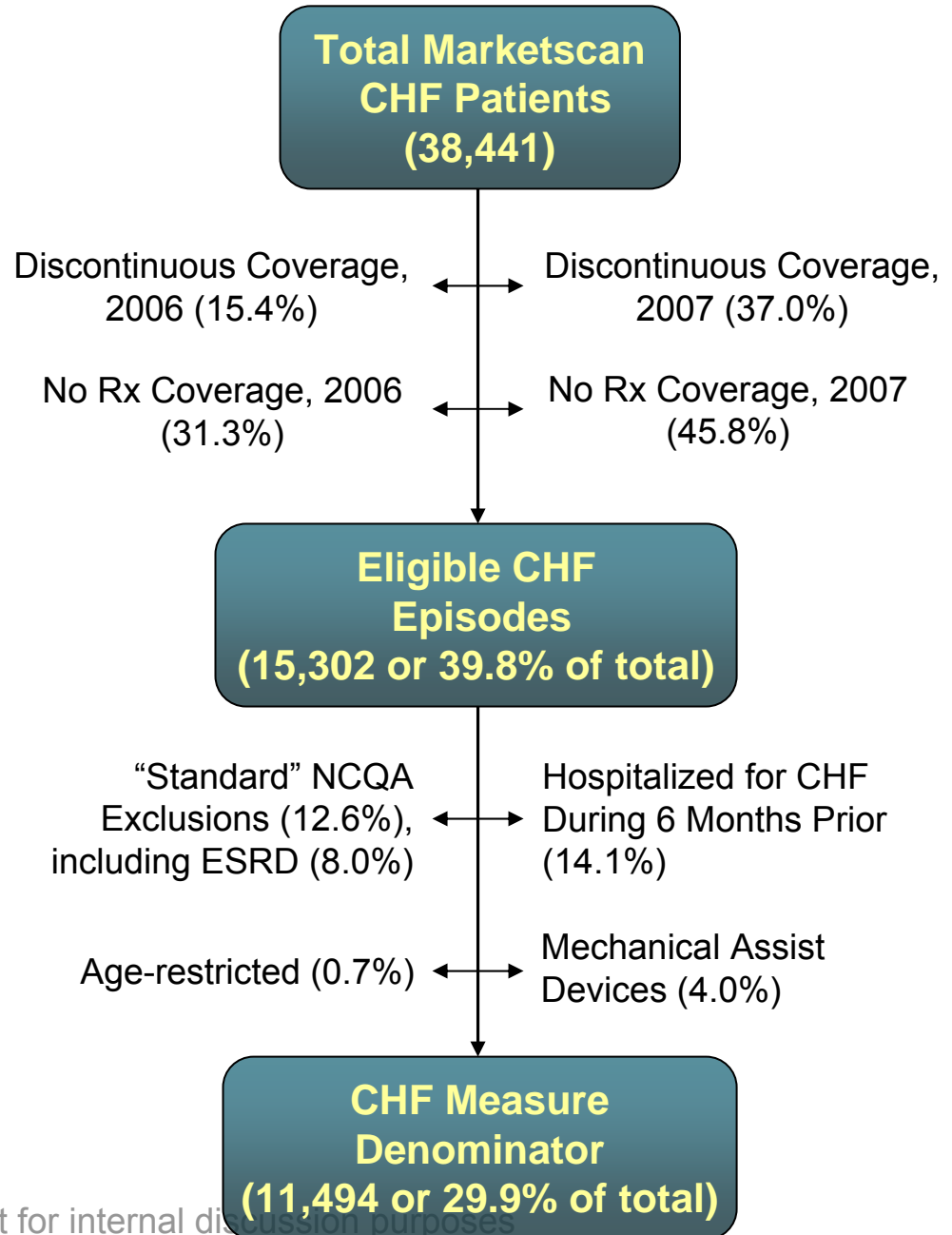
- **Note: 15% of total episode costs overall**

# Congestive Heart Failure

- CHF Chronic Management: Drugs, E&M care, testing, and other services provided in the treatment or management among patients with prevalent CHF over a 12-month period
  - Preliminary efforts to assess observed variability across CHF episodes and identify cost-driving services

## CHF Chronic Measure Denominator

- 12 months of CHF care for patient with 2+ CHF ambulatory care visits over preceding and measurement years (at least 1 visit more than 1 month before measurement year)
- Measurement window: January 1, 2007 – December 31, 2007
- 2006-2007 test data - Marketscan
- Note: exclusions are not additive (double-counting occurs often)



# Chronic CHF: Resource Use by Type of Service vs. Overall Mean, by State

Description	Mean	TX	GA	CA	TN	SC	MS	AL	FL	IL	OH
<b>N</b>	<b>3,378</b>	<b>550</b>	<b>510</b>	<b>283</b>	<b>263</b>	<b>246</b>	<b>158</b>	<b>147</b>	<b>94</b>	<b>88</b>	<b>82</b>
Inpatient Facility	\$2,841	0.87	1.17	0.93	1.47	0.63	0.77	1.64	0.66	1.66	1.77
DME	\$209	1.01	1.26	1.02	1.19	0.67	0.39	0.94	0.78	1.10	1.27
OP Facility	\$709	2.22	0.03	0.07	0.45	0.93	0.05	1.08	0.25	2.41	1.80
Imaging	\$578	1.04	0.96	0.83	1.31	1.12	0.75	0.94	1.33	0.97	0.97
E&M	\$571	0.92	1.22	0.89	1.20	0.71	0.71	1.17	1.12	1.29	1.49
Other Services	\$75	0.71	2.43	1.90	1.01	0.29	0.34	0.67	0.66	0.29	0.61
Procedures	\$305	1.08	0.90	0.67	1.61	0.94	0.24	1.14	0.72	1.28	0.91
Tests	\$360	1.19	0.99	0.80	1.08	1.01	0.56	0.84	1.11	1.44	0.84
Unclassified	\$37	0.11	3.52	1.18	3.67	0.51	0.06	0.26	0.00	0.03	0.02
Drug Costs	\$1,493	0.99	0.89	0.93	1.14	0.97	0.90	1.16	1.01	0.98	1.03
<b>Total</b>	<b>\$7,178</b>	<b>1.07</b>	<b>0.99</b>	<b>0.83</b>	<b>1.25</b>	<b>0.80</b>	<b>0.67</b>	<b>1.29</b>	<b>0.81</b>	<b>1.44</b>	<b>1.41</b>

# Chronic CHF: Resource Use by Type of Service vs. Overall Mean, by Specialty\*

- Results presented for high-volume specialties: Top 5

Description	Mean	Cardiology	Internal Medicine	Family Practice	Medical Doctor NEC	Multi-Specialty Group
<b>N</b>	<b>3,378</b>	<b>1,480</b>	<b>775</b>	<b>644</b>	<b>299</b>	<b>262</b>
Inpatient Facility	\$2,841	1.07	0.96	0.91	0.79	1.00
DME	\$209	0.80	1.15	1.07	0.67	1.15
OP Facility	\$709	1.09	0.73	0.71	0.68	0.99
Imaging	\$578	1.19	0.96	0.86	0.91	0.85
E&M	\$571	0.97	1.05	1.00	0.82	0.81
Other Services	\$75	1.15	0.54	0.81	0.29	1.62
Procedures	\$305	1.40	0.93	0.82	0.55	0.77
Tests	\$360	1.15	1.03	0.89	0.85	0.92
Unclassified	\$37	0.84	1.12	1.44	0.07	1.28
Drug Costs	\$1,493	1.06	0.98	0.93	1.00	0.93
<b>Total</b>	<b>\$7,178</b>	<b>1.08</b>	<b>0.95</b>	<b>0.90</b>	<b>0.81</b>	<b>0.95</b>

\* Individual episodes may be attributed to as many as three providers, and so the resource use associated with any given episode may be reflected in the results for up to three provider specialties; cardiologists will be the subject of further analysis on slide 8

# Chronic CHF: Related Services and Costs, Top 20% vs. Bottom 80% of Cardiologists

Description	Costs per Episode	% of Total	Services*		Top 20% / Bottom 80%	
			Bottom 80%	Top 20%	Services*	Costs*
IP Facility	\$3,323.64	42.0%	0.12	0.35	2.96	4.69
Drug Costs	\$1,476.84	18.7%	28.29	29.22	1.03	1.11
Imaging	\$632.05	8.0%	4.90	8.13	1.66	1.37
OP Facility	\$606.38	7.7%	2.09	1.88	0.90	4.56
E&M	\$604.71	7.6%	5.25	11.53	2.20	2.47
Procedures	\$433.59	5.5%	0.56	1.42	2.55	2.54
Tests	\$424.59	5.4%	8.90	20.55	2.31	1.44
DME	\$167.46	2.1%	1.45	2.93	2.03	2.27
Other	\$160.13	2.0%	0.31	0.80	2.53	1.69
Unclassified	\$79.09	1.0%	0.09	0.04	0.46	0.40
<b>Total</b>	<b>\$7,908.48</b>	<b>100.0%</b>	<b>51.95</b>	<b>76.85</b>	<b>1.48</b>	<b>2.78</b>

\* Results calculated per episode

# Chronic CHF: Cost-Drivers, Drug Costs

Description	Costs per Episode	% of Total	Scripts per Episode		Top 20% / Bottom 80% Ratio
			Bottom 80%	Top 20%	
Carvedilol	\$326.33	21.2%	3.49	4.28	<b>1.23</b>
Atorvastatin Calcium	\$105.45	6.8%	0.89	0.80	<b>0.90</b>
Clopidogrel Hydrogen Sulfate	\$105.03	6.8%	0.79	0.73	<b>0.92</b>
Simvastatin	\$70.90	4.6%	0.62	1.02	<b>1.64</b>
Ramipril	\$53.12	3.4%	0.82	1.26	<b>1.54</b>
Warfarin Sodium	\$44.72	2.9%	1.45	2.25	<b>1.56</b>
Lisinopril	\$43.53	2.8%	1.80	1.51	<b>0.84</b>
Rosuvastatin Calcium	\$43.20	2.8%	0.43	0.45	<b>1.06</b>
Ezetimibe	\$40.18	2.6%	0.40	0.42	<b>1.07</b>
Ezetimibe/Simvastatin	\$39.82	2.6%	0.43	0.77	<b>1.78</b>
Spironolactone	\$39.53	2.6%	1.62	2.66	<b>1.64</b>
Valsartan	\$38.15	2.5%	0.72	0.62	<b>0.85</b>
Metoprolol Succinate	\$36.74	2.4%	1.17	0.53	<b>0.45</b>
Carvedilol Phosphate	\$36.60	2.4%	0.23	0.30	<b>1.29</b>
Niacin	\$33.86	2.2%	0.21	0.30	<b>1.42</b>
Fenofibrate	\$31.71	2.1%	0.30	0.16	<b>0.54</b>
Furosemide	\$27.37	1.8%	2.96	2.87	<b>0.97</b>
Eplerenone	\$26.84	1.7%	0.22	0.16	<b>0.74</b>
Amlodipine Besylate	\$26.15	1.7%	0.44	0.57	<b>1.28</b>
Pravastatin Sodium	\$23.34	1.5%	0.19	0.19	<b>1.01</b>

- **Note: 19% of total episode costs overall**

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# Chronic CHF: Cost-Drivers, Imaging

CPT	Description	Costs per Episode	% of Total	Services per Episode		Top 20% / Bottom 80% Ratio
				Bottom 80%	Top 20%	
93307	Echocardiography, transthoracic, real-time with ima	\$164.32	26.0%	0.73	1.01	1.39
78465	Myocardial perfusion imaging; tomographic (SPEC	\$93.29	14.8%	0.20	0.13	0.65
93325	Doppler echocardiography color flow velocity mapp	\$84.88	13.4%	0.72	1.13	1.57
93320	Doppler echocardiography, pulsed wave and/or co	\$73.79	11.7%	0.73	1.04	1.43
71020	Radiologic examination, chest, two views, frontal a	\$23.44	3.7%	0.66	1.02	1.54
71010	Radiologic examination, chest; single view, frontal	\$17.76	2.8%	0.47	1.67	3.54
78478	Myocardial perfusion study with wall motion, qualita	\$15.99	2.5%	0.19	0.13	0.71
78480	Myocardial perfusion study with ejection fraction (L	\$14.99	2.4%	0.18	0.13	0.73
A9502	Technetium tc-99m tetrofosmin, diagnostic, per stu	\$14.37	2.3%	0.07		
93556	Imaging supervision, interpretation and report for ir	\$12.47	2.0%	0.11	0.16	1.50
93312	Echocardiography, transesophageal, real time with	\$10.02	1.6%	0.02	0.09	4.39
78472	Cardiac blood pool imaging, gated equilibrium; plat	\$9.16	1.4%	0.04	0.03	0.78
93555	Imaging supervision, interpretation and report for ir	\$8.51	1.3%	0.09	0.11	1.18
A9500	Technetium tc-99m sestamibi, diagnostic, per stud	\$8.25	1.3%	0.04	0.04	1.10
93545	Injection procedure during cardiac catheterization;	\$6.58	1.0%	0.11	0.14	1.34
93880	Duplex scan of extracranial arteries; complete bilat	\$5.17	0.8%	0.02	0.05	2.20
71275	Computed tomographic angiography, chest (noncc	\$4.23	0.7%	0.02	0.02	1.10
75554	Cardiac magnetic resonance imaging for function,	\$4.07	0.6%	0.00	0.04	17.58
A9505	Thallium tl-201 thallos chloride, diagnostic, per m	\$3.94	0.6%	0.02	0.01	0.55
93543	Injection procedure during cardiac catheterization;	\$3.55	0.6%	0.09	0.10	1.13

- **Note: 8% of total episode costs overall**

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# Proposed Attribution Model: Diabetes

- “Tiered” attribution model, depending on the number of each episode’s DM-related E&M visits during the measurement period and the distribution of those visits across providers
  - Requires that the episode has at least 1 E&M visit and that at least 70% of the E&M visits include valid provider ID numbers
- Tier 1 – Single Attribution: if one provider ID has at least 70% of an episode’s E&M visits, that provider will be attributed the episode
- Tier 2 – “Multiple” Attribution: if no provider has at least 70% of the episode’s E&M visits, any provider with at least 30% will be attributed the episode
- Tier 3 – No Attribution: if no provider has at least 30% of the episode’s E&M visits, no provider will be attributed the episode

# Diabetes Episode: Attribution Testing

- Required: 1)  $\geq 1$  E&M visit for diabetes care; 2)  $\geq 70\%$  of E&M visits with valid provider IDs
- 1 provider with  $\geq 70\%$  of E&M visits – single attribution only; else
- 1+ providers with  $\geq 30\%$  of E&M visits – up to 3 providers attributed episode; else
- No attribution

<b>Diabetes Measure Denominator</b>	<b>233,029</b>	<b>100.0%</b>
No related E&M visits during measurement year	3,702	1.6%
Episode's E&M visits have insufficient provider IDs	126,217	54.2%
Episodes to be attributed	103,110	44.2%
<b>Single attribution</b>	<b>82,646</b>	<b>80.2%</b>
<b>Multiple attribution</b>	<b>16,612</b>	<b>16.1%</b>
<i>2 providers</i>	16,294	15.8%
<i>3 providers</i>	318	0.3%
<b>No attribution</b>	<b>3,852</b>	<b>3.7%</b>

# Providers per Episode by Attribution Tier

# of Providers	70% +	%	30%-70%	%	No Attr.	%
1	23,798	48.0%				
2	15,597	31.4%	7,063	14.2%		
3	6,981	14.1%	11,858	23.9%	4	0.1%
4	2,323	4.7%	11,249	22.7%	167	4.3%
5	631	1.3%	8,100	16.3%	418	10.9%
6	190	0.4%	5,037	10.1%	551	14.3%
7	51	0.1%	2,875	5.8%	628	16.3%
8	18	0.0%	1,591	3.2%	580	15.1%
9	7	0.0%	854	1.7%	432	11.2%
10	5	0.0%	482	1.0%	351	9.1%
11			245	0.5%	253	6.6%
12			122	0.2%	152	3.9%
13			85	0.2%	96	2.5%
14			35	0.1%	79	2.1%
15			29	0.1%	52	1.3%
16			15	0.0%	35	0.9%
17			6	0.0%	21	0.5%
18			5	0.0%	6	0.2%
19			3	0.0%	4	0.1%
20+			3	0.0%	23	0.6%
<b>Grand Total</b>	<b>49,601</b>	<b>100.0%</b>	<b>49,657</b>	<b>100.0%</b>	<b>3,852</b>	<b>100.0%</b>
<b>AVERAGE</b>	<b>1.8</b>		<b>4.4</b>		<b>8.3</b>	

# Attributed Providers by Specialty

Specialty Description	Episodes Attributed	% of Episodes
Family_Practice_____240	40,369	39.2%
Internal_Medicine__NEC____204	32,691	31.7%
Medical_Doctor___MD__NEC___200	7,357	7.1%
MultiSpecialty_Physician_Gr206	5,501	5.3%
Endocrinology___Metabolism_270	5,291	5.1%
Cardiovascular_Dis_Cardiolo250	2,981	2.9%
Podiatry_____130	1,791	1.7%
Orthopaedic_Surgery_____530	1,553	1.5%
Acute_Care_Hospital_____001	1,297	1.3%
Ophthalmology_____330	1,117	1.1%
Urology_____210	978	0.9%
Nurse_Practitioner_____825	880	0.9%
Pediatrician__NEC_____400	758	0.7%
Dermatology_____215	739	0.7%
Gastroenterology_____275	720	0.7%
Obstetrics___Gynecology____320	655	0.6%
Neurology_____260	648	0.6%
Otolaryngology_____340	608	0.6%
Surgeon__NEC_____500	537	0.5%
Other_Facility__NEC_____040	475	0.5%
OTHER	5,887	5.7%
<b>TOTAL</b>	<b>103,110</b>	<b>100.0%</b>

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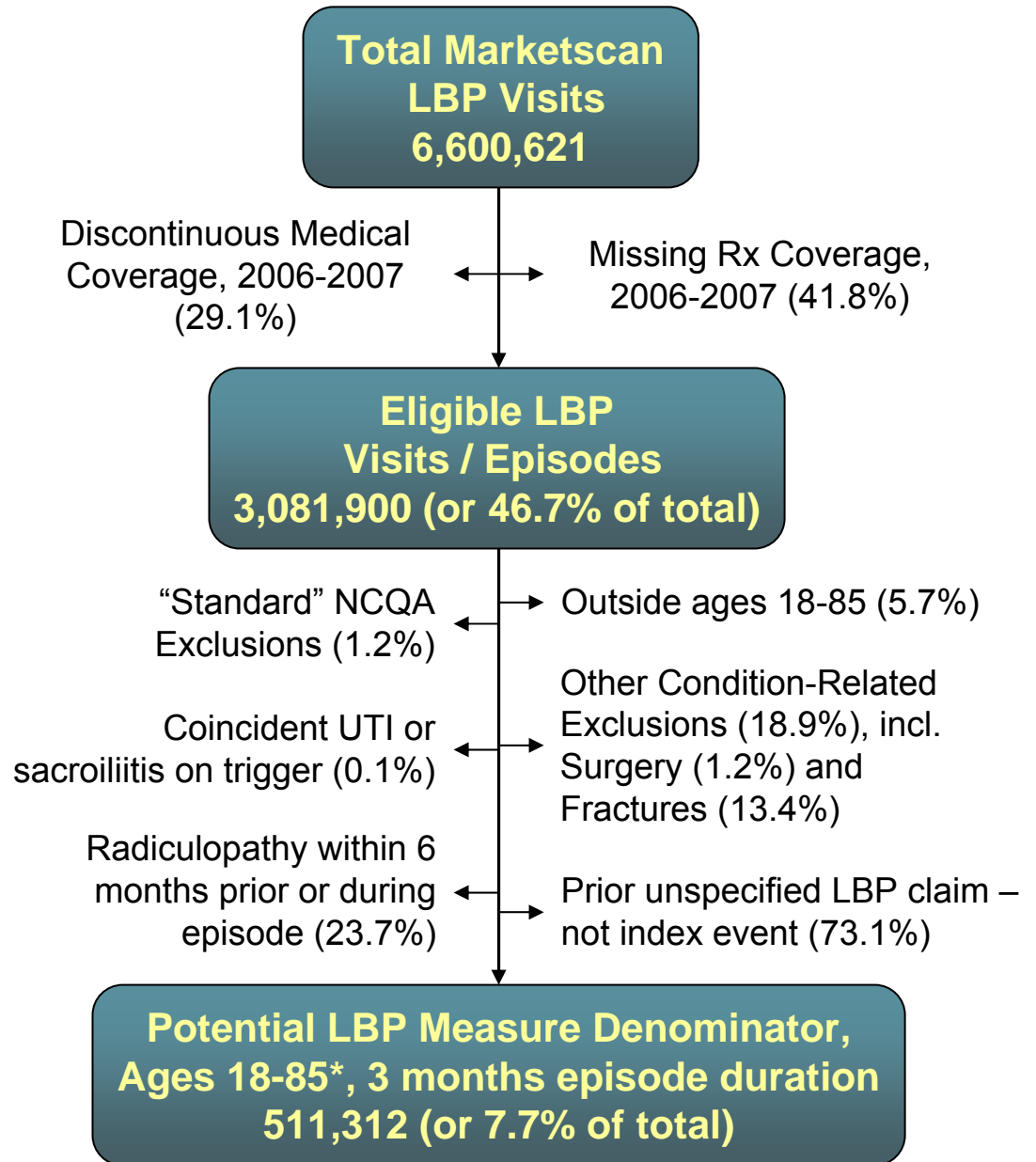
# Low Back Pain

- Low Back Pain Unspecified: Physical therapy, chiropractic, drugs, imaging, procedures, and other services provided in the treatment of patients experiencing episodes of low back pain over a 3-month (or 6-week) period
  - Closer look at resource use findings, previously suspected of under-representing imaging and outpatient facility costs
- Low Back Pain – Radiculopathy: Similar episode for patients also experiencing sciatica and other related conditions

## Unspecified LBP Measure Denominator

- 3 mos. (or 6 wks.) of care for patient with 1+ ambulatory care visits with non-specific LBP ICD-9 code (expanded list): 724.2, 724.5, 724.8, 724.9, 739.3, 739.4 or 847.2
- Ages 18-85\*, to be stratified into elderly and non-elderly groups
- Episode triggers between July 1, 2006 and August 31, 2007
- Test data: Marketscan 2006-2007
- Note: exclusions are not additive (double-counting occurs often)

\* Marketscan database contains data for non-elderly population only (under 65); as such, no data are presented for the elderly (65+) group



# Resource Use by Type of Service: LBP Unspecified - 3MO

- All episode triggers

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
Inpatient facility charge	\$5	1%	\$0	\$0	\$0	\$0	\$0
OP Facility Costs	\$29	8%	\$0	\$0	\$0	\$0	\$0
Evaluation and Management	\$87	22%	\$0	\$44	\$65	\$107	\$248
Procedures	\$99	26%	\$0	\$0	\$0	\$47	\$534
Imaging	\$29	8%	\$0	\$0	\$0	\$0	\$103
Tests	\$4	1%	\$0	\$0	\$0	\$0	\$6
Durable Medical Equipment	\$2	1%	\$0	\$0	\$0	\$0	\$0
Other Services	\$66	17%	\$0	\$0	\$0	\$70	\$342
Unclassified	\$1	0%	\$0	\$0	\$0	\$0	\$0
Drug Costs	\$64	17%	\$0	\$0	\$3	\$43	\$281
<b>Sum of charges</b>	<b>\$385</b>	<b>100%</b>	<b>\$55</b>	<b>\$99</b>	<b>\$183</b>	<b>\$395</b>	<b>\$1,357</b>

Note: results do not reflect the specialty of the physician providing/ordering the care (e.g., chiropractors may bill using a “standard” E&M CPT code)

# “Episode Fragments” – LBP Unspecified (3-month)

- More than 12% of episodes with non-zero resource use only had a single service (the triggering service) captured as related

Total Services During Episode	Mean Costs/ Episode	Episode Cost Range								Grand Total	
		\$0-100	\$100-200	\$200-300	\$300-400	\$400-500	\$500-750	\$750-1000	\$1000plus		
1	\$70	54,100 10.65%	6,382 1.26%	583 0.11%	16 0.00%					2 0.00%	61,083 12.02%
2 - 4	\$145	71,331 14.04%	93,831 18.46%	18,236 3.59%	4,696 0.92%	1,546 0.30%	1,835 0.36%	1,018 0.20%	583 0.11%	193,076 37.99%	
5 - 10	\$343	2,754 0.54%	43,923 8.64%	46,992 9.25%	25,126 4.94%	11,250 2.21%	9,397 1.85%	4,459 0.88%	5,145 1.01%	149,046 29.33%	
11 - 20	\$731	23 0.00%	572 0.11%	4,054 0.80%	9,832 1.93%	12,471 2.45%	20,455 4.02%	6,758 1.33%	8,719 1.72%	62,884 12.37%	
21 - 50	\$1,390		4 0.00%	30 0.01%	102 0.02%	436 0.09%	5,323 1.05%	8,909 1.75%	19,788 3.89%	34,592 6.81%	
51 - 302	\$2,653					1 0.00%	2 0.00%	5 0.00%	7,522 1.48%	7,530 1.48%	
ALL EPISODES	\$385	128,208	144,712	69,895	39,772	25,704	37,012	21,149	41,759	508,211	

# “Episode Fragments” - Imaging

- Reasonably large proportions of each episode’s denominator have non-zero imaging costs.

Episode	Unspecified LBP	Unspecified LBP	LBP Radiculopathy
Duration	3 months	6 weeks	3 months
Denominator (> \$0)	508,211	593,668	163,471
Non-zero imaging	100,281	96,500	78,003
%	19.7%	16.3%	47.7%
<i>Imaging costs among episodes with non-zero imaging resource use</i>			
Mean	\$146.44	\$140.93	\$393.59
Median	\$63.14	\$63.14	\$159.50
Mode	\$49.03	\$49.03	\$49.03
Min	\$14.41	\$12.30	\$14.41
75th percentile	\$104.06	\$101.38	\$652.49
90th percentile	\$408.42	\$326.22	\$939.10
Max	\$6,689.90	\$6,689.90	\$21,741.80

# HEDIS-specified Resource Use & HVHC Per-Capita Analysis, Unspecified LBP (3-month)

- For the HVHC episode denominators, HVHC staff conducted three analyses to assess resource use: HVHC-defined related resource use, HEDIS-defined related resource use (per the HEDIS overuse measure), and per-capita resource use
- Findings for the HVHC-specified and HEDIS-specified resource use are highly comparable, while per-capita costs extend well beyond HVHC- and HEDIS-specified.

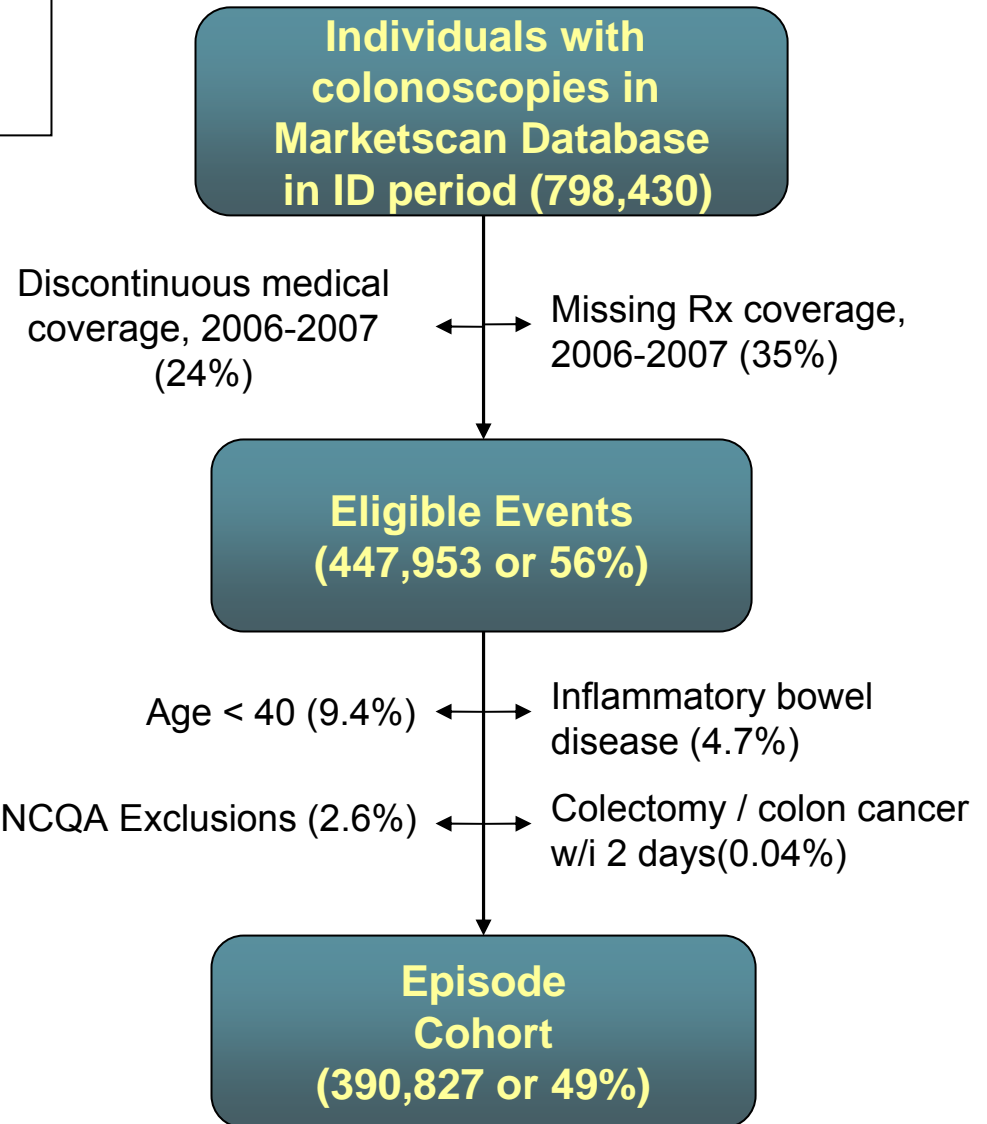
Description	Related	Rel % of PC	w/ HEDIS	HEDIS % of PC	Per Capita
Inpatient Facility Costs	\$4.91	4.6%	\$4.97	4.7%	\$105.88
OP Facility Costs	\$29.03	17.9%	\$29.31	18.1%	\$161.81
Evaluation and Management Procedures	\$86.54	32.4%	\$87.30	32.7%	\$267.28
Imaging	\$98.75	35.2%	\$99.86	35.6%	\$280.76
Tests	\$29.05	22.7%	\$29.16	22.7%	\$128.23
Durable Medical Equipment	\$3.57	4.7%	\$3.58	4.7%	\$75.87
Other Services	\$2.11	9.8%	\$2.13	9.9%	\$21.49
Unclassified	\$65.93	64.3%	\$66.35	64.7%	\$102.51
Drug Costs	\$0.50	7.1%	\$0.51	7.2%	\$7.07
Total Costs	\$64.37	18.2%	\$64.37	18.2%	\$354.56
	\$384.76	25.6%	\$387.54	25.7%	\$1,505.46

# Colon Cancer

- Colonoscopy: All costs (drugs, procedures, admissions resulting from complications, etc.) during the 7 days preceding and 14 days following a screening colonoscopy
  - Preliminary analysis of episode denominator
- Colon Cancer Treatment: For patients with localized colon cancer, all treatment-related costs (procedures, chemotherapy, radiation therapy, etc.) during the 30 days preceding and 11-months following a colectomy
  - Preliminary analysis of episode denominator

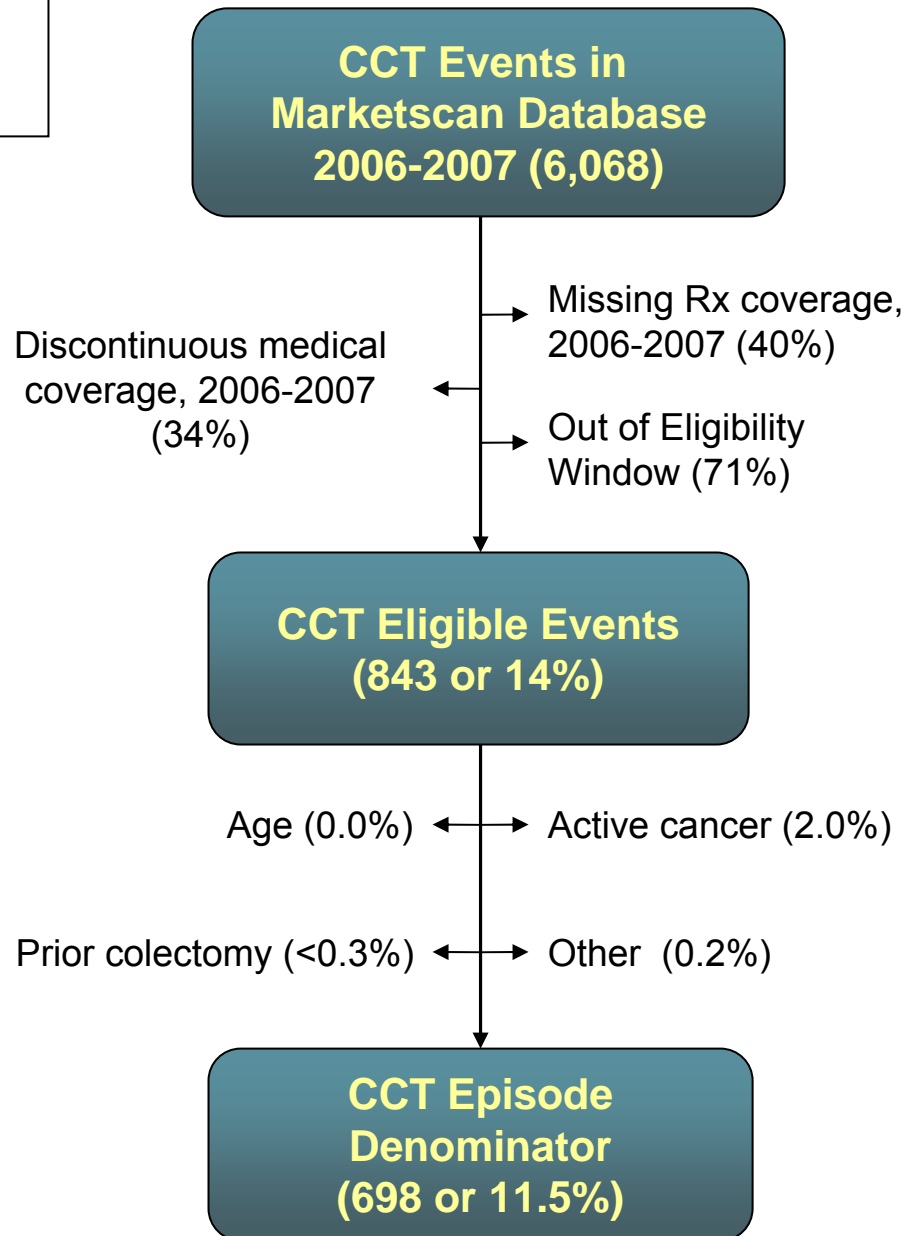
# Colonoscopy Measure Denominator

- Procedure codes for colonoscopy
- Identification period: 8 Jan 2007 – 17 Dec 2007. Only 1<sup>st</sup> is eligible.
- Age 40 years or more
- NCQA Exclusions: Active cancer (except colon cancer), ESRD, dialysis, Renal failure, organ transplant, HIV / AIDS
- Colectomy with colon cancer within two days following colonoscopy
- Inflammatory bowel disease. Including:
  - ulcerative colitis,
  - Crohn's disease,
  - Other inflammatory bowel disease
- Note: exclusions are not additive (double-counting occurs often); figures do not exclude episodes with \$0 in related resource use



# Colon Cancer Treatment Measure Denominator

- Procedure code for colectomy and dx for colon cancer
- Identification period: Jul. 1, 2006 – Jan. 31, 2007
- Age 18-85
- Exclusions:
  - Prior colectomy
  - Active cancer (except colon cancer)
  - ESRD, dialysis
  - Renal failure
  - Organ transplant
  - HIV / AIDS
- Note: exclusions are not additive (double-counting occurs often); figures do not exclude episodes with \$0 in related resource use



# Discussion

- Are observed results in line with expectations from a clinical perspective?
- Are the analyses presented useful as structured (i.e., initially for the consumption of clinical specialists)?
- How might these analyses be presented in a different way so as to make them more useful for other audiences?
- What could be done methodologically to improve the precision or completeness of the analyses?