

CHCS

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FACES OF MEDICAID
DATA SERIES

Multimorbidity Pattern Analyses and Clinical Opportunities: *Congestive Heart Failure*

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This set of tables is part of the analysis, *Clarifying Multimorbidity to Improve Targeting and Delivery of Clinical Services for Medicaid Populations*, which was undertaken by the Center for Health Care Strategies and The Johns Hopkins University School of Medicine and Bloomberg School of Public Health to help policymakers identify intervention strategies with the potential to both improve quality and reduce costs for Medicaid beneficiaries with multiple chronic conditions. For the full report, visit www.chcs.org.

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*The **Center for Health Care Strategies (CHCS)** is a nonprofit health policy resource center dedicated to improving health care quality for low-income children and adults, people with chronic illnesses and disabilities, frail elders, and racially and ethnically diverse populations experiencing disparities in care. CHCS works with state and federal agencies, health plans, providers and consumer groups to develop innovative programs that better serve Medicaid beneficiaries with complex and high-cost health care needs. Its program priorities are: enhancing access to coverage and services; improving quality and reducing racial and ethnic disparities; integrating care for people with complex and special needs; and building Medicaid leadership and capacity.*

Overview

This set of tables is part of the *Faces of Medicaid* analysis, *Clarifying Multimorbidity to Improve Targeting and Delivery of Clinical Services for Medicaid Populations*, undertaken by the Center for Health Care Strategies (CHCS) and The Johns Hopkins University School of Medicine and Bloomberg School of Public Health. The analysis sought to help policymakers identify intervention strategies with the potential to both improve quality and reduce costs for adult Medicaid beneficiaries with multiple chronic conditions.

The following tables summarize multimorbidity data on congestive heart failure for adult Medicaid-only beneficiaries with disabilities under the age of 65, and inventory potential clinical opportunities for addressing multimorbidity associated with congestive heart failure. For this analysis, “multimorbidity patterns” are defined as the specific and often multiple conditions that a person has (e.g., a person with depression, hypertension, chronic pain, and asthma), as opposed to a simple tally of the number of conditions that someone has (e.g., a person with five chronic conditions). The tables are intended to aid policymakers in identifying subgroups of Medicaid beneficiaries who stand to benefit from targeted care management and tailoring intervention strategies to improve health outcomes and reduce costs. Contents include:

1. **Multimorbidity Summary Table (Table 1):** This table lists the five most costly patterns of multimorbidity (based on total annual costs, excluding long-term care expenditures) for congestive heart failure. These data can be used to help prioritize care management opportunities to improve outcomes and control costs. Prevalence, costs, and hospitalization rates are summarized for:
 - Beneficiaries who *only* have the specific congestive heart failure pattern, without additional comorbidities.
 - Beneficiaries who have the specific congestive heart failure pattern *plus* potentially other comorbidities. In other words, all individuals represented in this group have the conditions specified in the stated multimorbidity pattern, but any individual may have other conditions as well. This broader approach has a greater likelihood of capturing all individuals with congestive heart failure and the identified comorbidities in the population.
2. **Multimorbidity Pattern Table (Table 2):** This table details the 16 most prevalent multimorbidity patterns for congestive heart failure, including prevalence, cost, and hospitalization data for each. Data include beneficiaries who only have the specific conditions in each multimorbidity pattern.
3. **Clinical Opportunities Table (Table 3):** A series of literature searches was conducted for the multimorbidity patterns that the analysis identified as high-priority opportunities from a prevalence, clinical, and cost perspective. In addition to presenting actionable, clinical opportunities for Medicaid stakeholders responsible for care management program design, this clinical opportunities table helps identify gaps in knowledge around clinical management of these conditions. Literature is categorized as follows:
 - Clinical “pearls” that offer recommendations relevant to an aspect of care for individuals with the specified multimorbidity pattern;
 - Single disease-specific models that address processes important to caring for individuals with multimorbidity, such as care coordination and medication management;
 - Relevant clinical practice guidelines and systematic reviews; and
 - Evidence-based models for the specific multimorbidity pattern.

Table 1: Congestive Heart Failure Multimorbidity Summary

This table lists the five most costly patterns of multimorbidity -- based on total annual costs, excluding long-term care expenditures -- for congestive heart failure. These data can be used to help prioritize care management opportunities to improve outcomes and control costs.

Medicaid-Only Adult Beneficiaries with Disabilities, Under Age 65

Multimorbidity Pattern	Prevalence among beneficiaries with congestive heart failure	Prevalence among overall population	Per capita cost	Percent of total annual costs among beneficiaries with congestive heart failure	Percent of total annual costs among overall population	Per capita hospitalizations
Congestive Heart Failure						
1 +Hypertension, Psychiatric Disorders, Coronary Heart Disease, Diabetes	1.17%	0.07%	\$16,429	0.81%	0.11%	0.86
	21.56%	1.28%	\$33,143	30.26%	4.01%	2.40
2 +Hypertension, Coronary Heart Disease, Diabetes	1.32%	0.08%	\$13,071	0.73%	0.10%	0.75
	30.69%	1.83%	\$30,085	39.10%	5.19%	2.16
3 +Psychiatric Disorders	0.86%	0.05%	\$16,297	0.60%	0.08%	0.34
	64.28%	3.82%	\$27,267	74.22%	9.84%	1.78
4 +Hypertension, Psychiatric Disorders, Coronary Heart Disease, Diabetes, Chronic Renal Failure/End Stage Renal Disease	0.40%	0.02%	\$34,247	0.58%	0.08%	1.94
	5.27%	0.31%	\$51,344	11.47%	1.52%	3.46
5 +Hypertension, Psychiatric Disorders, Coronary Heart Disease, Asthma and/or Chronic Obstructive Pulmonary Disease, Diabetes	0.70%	0.04%	\$18,188	0.54%	0.07%	1.26
	12.40%	0.74%	\$35,796	18.79%	2.49%	2.79

Co-occurring conditions that were considered include: Depressive disorders, hypertension, coronary heart disease, asthma and/or chronic obstructive pulmonary disease, back or spine disorders, antipsychotic or mood stabilizer drugs, drug and alcohol disorders, diabetes, anxiety disorder or benzodiazepam use, congestive heart failure, hepatitis or chronic liver disease, stroke, prednisone use, dizziness, gastrointestinal bleed, anticoagulation drugs (warfarin), chronic renal failure/end stage renal disease, HIV or AIDS, and personality disorders.

KEY

- Beneficiaries with only congestive heart failure and the specified multimorbidity pattern (no other comorbidities).
- Beneficiaries with congestive heart failure, the specified multimorbidity pattern, and potentially other additional comorbidities, varying by individual.

Table 2: Congestive Heart Failure Multimorbidity Patterns

This table presents the 16 most prevalent co-occurring conditions for congestive heart failure (columns in the left half), and prevalence, hospitalization, and cost data for each pattern (columns in the right half). These data reveal patterns that are prime for targeted interventions across a number of variables of interest, including: population prevalence, per capita costs, and annual hospitalization rate. For each pattern, these variables are calculated for individuals who have the specified conditions and no other comorbidities. The condition columns are ordered from most prevalent (left) to least prevalent (right) in the congestive heart failure population. A checkmark represents the presence of the specified condition. Unless noted, all cost estimates exclude long-term care costs.

Medicaid-Only Adult Beneficiaries with Disabilities, Under Age 65

Congestive Heart Failure +																Pattern Prevalence, % ¹	Cumulative Prevalence, %	Annual Hospitalization rate Per Capita	Per Capita Costs, excl. Long-term Care	% Total Annual Costs, excl. Long-term Care ²	Cumulative % of Total Annual Costs, excl. Long-term Care	% Total Annual Long-term Care Costs	Very High-Cost Prevalence, % ³	High-Cost Prevalence, % ⁴				
Hypertension	Psychiatric disorders	Coronary heart disease	Asthma and/or chronic obstructive pulmonary disease	Diabetes	Chronic pain	Back or spine disorders	Drug and alcohol disorders	Stroke	Chronic renal failure/end stage renal disease	Anticoagulation drugs (warfarin)	Home oxygen therapy	Prednisone use	Hepatitis or chronic liver disease	Dizziness	Gastrointestinal bleed	Antiepileptic drugs	Hospital bed distributed	Dementia										
1	✓		✓		✓														1.32%	1.32%	0.75	\$13,071	0.73%	0.73%	0.43%	6.37%	25.68%	
2																				1.20%	2.52%	0.26	\$6,688	0.34%	1.07%	1.38%	1.41%	8.64%
3	✓		✓																	1.18%	3.70%	0.47	\$7,547	0.38%	1.45%	0.30%	2.96%	14.42%
4	✓	✓	✓		✓															1.17%	4.87%	0.86	\$16,429	0.81%	2.26%	0.80%	7.42%	38.53%
5	✓																			1.15%	6.02%	0.19	\$5,605	0.27%	2.53%	0.43%	1.17%	6.40%
6	✓	✓	✓																	0.92%	6.94%	0.56	\$11,967	0.47%	3.00%	0.65%	4.65%	23.72%
7		✓																		0.86%	7.80%	0.34	\$16,297	0.60%	3.60%	2.41%	4.25%	22.38%
8	✓	✓																		0.81%	8.62%	0.35	\$10,081	0.35%	3.94%	0.95%	2.64%	17.71%
9	✓				✓															0.79%	9.40%	0.31	\$7,079	0.24%	4.18%	0.30%	1.82%	13.67%
10			✓																	0.73%	10.13%	0.37	\$7,162	0.22%	4.40%	0.40%	3.42%	11.11%
11	✓	✓	✓	✓	✓															0.70%	10.84%	1.26	\$18,188	0.54%	4.95%	0.57%	13.07%	43.91%
12	✓	✓			✓															0.66%	11.50%	0.50	\$13,861	0.39%	5.34%	0.79%	4.98%	32.71%
13	✓	✓	✓	✓																0.56%	12.06%	0.87	\$14,648	0.35%	5.68%	0.44%	7.54%	36.28%
14	✓		✓	✓	✓															0.55%	12.61%	1.03	\$13,378	0.31%	5.99%	0.17%	6.03%	38.76%
15	✓		✓	✓																0.51%	13.12%	0.77	\$10,701	0.23%	6.22%	0.13%	5.41%	22.51%
16		✓	✓																	0.50%	13.62%	0.41	\$14,478	0.31%	6.53%	0.56%	4.47%	22.18%

KEY

- Index condition with no comorbidity in identified conditions.
- Patterns with the top three highest total annual costs.
- Patterns with the top three highest annual hospitalization rates.
- Patterns with the top three high-cost prevalence rates.

¹ Prevalence of this pattern among beneficiaries with congestive heart failure.
² \$2.6 billion, excluding long-term care costs, was spent by Medicaid on 111,792 disabled Medicaid-only beneficiaries with congestive heart failure. Results are presented for the top 16 out of 16,227 total patterns observed for people with congestive heart failure.
³ The proportion of beneficiaries with this specific multimorbidity pattern who are represented among beneficiaries in the top 1st to 5th percentile of costs in the overall population of Medicaid-only adult beneficiaries with disabilities.
⁴ The proportion of beneficiaries with this specific multimorbidity pattern who are represented among beneficiaries in the top 5.01st to 20th percentile of costs in the overall population of Medicaid-only adult beneficiaries with disabilities.

Table 3: Congestive Heart Failure Clinical Opportunities

The following table inventories evidence-based models of care for congestive heart failure and associated multimorbid patterns, including references published since 2000). This resource provides an actionable complement to the multimorbidity cost and prevalence data presented earlier. It is intended to guide Medicaid stakeholders in tailoring implementation strategies to improve care for beneficiaries with these multimorbidity patterns.

A bibliography of full citations is available at www.chcs.org.

Clinical pearl for specific multimorbidity pattern	Single-disease focused clinical care delivery model for multimorbid patients	Clinical practice guidelines or systematic review for multimorbidity pattern	Model for specific multimorbidity pattern
Congestive Heart Failure + Psychiatric Disorders, Hypertension, Coronary Heart Disease, Diabetes			
Gottlieb 2007. Treating depression improves quality of life.	Aiken 2006. Phoenix Care: Case management and coordinated care for the seriously ill improved function.	Unpublished CHF and Diabetes Guideline (United Health care and BMJ group).	Aiken 2006. Phoenix Care: Case management and coordinated care for the seriously ill improved function.
Hunt 2009. Don't avoid b-blockers in diabetes.	Taylor 2005. Clinical Service Organization for Heart Failure	Hunt 2009. 2009 ACCF/AHA Heart Failure Guidelines: Concomitant Condition Section.	Cole 2006. Double disease management: depression and heart failure management is feasible and possibly effective.
Hunt 2009. Avoid calcium channel blockers in hypertensives and angina patients.	Clark 2007. Telemonitoring or structured telephone support for CHF improved quality of life and cost. (Additional refs: Scherr 2009, Soran 2008, Wakefield 2008)	Rees 2004. Exercise improved exercise capacity and quality of life in patients with mild to moderate CHF and patients with severe CHF may also benefit.	Alves 2005. Antidepressants improved cognitive performance of people with heart failure and depression.
Hunt 2009. Avoid Thiazolidinediones with Class III and IV HF.	Bausewein 2008. Non-pharmacological interventions help breathlessness in advanced stages.	Taylor 2005. Clinical service delivery models found mixed results.	Gary 2006. Walking program and education improved efficacy, six-minute walk performance, depressive symptoms, and quality of life.
Betti 2009. Pro-BNP may screen for those at high risk for HF.	Smeulders 2009. Self-management improved activity but not utilization.	Lane 2005. No RCT of psychological interventions in heart failure and depression.	Austin 2005. Cardiac rehabilitation with psychiatric counseling improved function, quality of life, and hospital admissions.
	Esposito 2008. Disease management for dual eligibles not effective.		Murray 2009. Pharmacist intervention to help people with CHD and/or CHF may decrease risk of adverse events and errors.
	Jaarsma 2008. COACH (moderate or intensive DM) did not reduce death or hospitalization.		Khunti 2007. Disease management for people with CHD and CHF may improve BP management and quality of life.
	Nguyen 2007. Disease management not effective six months after program cessation.		Coberley 2008. Cardiac disease case management program for patients with coronary artery disease and heart failure produced positive results.
	Hebert 2008. Nurse-led disease management improved quality of life cost-effectively in diverse urban community.		
	Riegel 2006. Disease management not effective in older Hispanics with low education level.		
	Khunti 2007. Disease management.		

Clinical pearl for specific multimorbidity pattern	Single-disease focused clinical care delivery model for multimorbid patients	Clinical practice guidelines or systematic review for multimorbidity pattern	Model for specific multimorbidity pattern
Congestive Heart Failure + Psychiatric Disorders, Hypertension, Coronary Heart Disease, Diabetes (continued)			
	Howlett 2009. Heart failure registry associated with less rehospitalization and mortality.		
Congestive Heart Failure + Developmental Disorders			
	Karlsson 2005. Nurse-based care for heart failure affects people with cognitive dysfunction the most.		
Congestive Heart Failure + Chronic Renal Failure /ESRD			
	Perry 2005. Peer mentors can increase the completion of advance directives.		
Congestive Heart Failure + Asthma/COPD			
Kotylyar 2002. Carvedilol is well-tolerated by patients with CHF and COPD, where as only 50% of asthma patients tolerated carvedilol, suggesting that carvedilol is poorly tolerated in asthma patients.	Rose 2009. Systematic review of non-invasive ventilation for acute exacerbation of CHF and obstructive lung disease in ED may be beneficial.		Whitten 2007. The addition of home telehealth care did not improve outcomes for home health care patients with COPD and/or CHF in a small study.
Jabbour 2010. Among patients with CHF and COPD, switching between beta-blockers of carvedilol, metoprolol succinate, and bisprolol was well-tolerated, but with changes in measured airway function.	Pladeck 2007. Non-invasive ventilation for acute exacerbations of either COPD and CHF are beneficial, with different titration algorithms.		Rutten 2005. A limited number of items in history, physical exam, EKG, and NT-proBNP can identify which COPD patients have concomitant heart failure.
Marcarenhas 2008. Beta-blockers well-tolerated in patients with CHF who also have COPD.	Afifi 2007. Disease management with supplementary telephone counseling for at least one of DM, Asthma, CHF reduced utilization in this non-randomized Medicaid population.		Maltais 2008. Alexander 2008. Skumlien 2008. Spruit 2007. Troosters 2004. Pulmonary rehabilitation may be effective in people with multimorbidity, including CHF.
	Woo 2009. Community exercise programs for COPD and CHF patients may improve outcomes for both conditions.		
	Rabow 2004. Outpatient palliative care consultation reduced dyspnea, anxiety and improved well-being, but no effect on pain or depression. Patients had CHF or COPD or cancer.		