CHCS Center for Health Care Strategies, Inc.

FACES OF MEDICAID
DATA BRIEF

Clarifying Multimorbidity Patterns to Improve Targeting and Delivery of Clinical Services for Medicaid Populations

By Cynthia Boyd, Bruce Leff, Carlos Weiss, Jennifer Wolff, Allison Hamblin, and Lorie Martin DECEMBER 2010

Although Medicaid finances vital health services for more than 60 million Americans, program costs are highly concentrated. Nearly 60 percent of Medicaid spending is incurred by just five percent of the program's beneficiaries,[1] including many with disabilities and multiple chronic health needs. In an earlier *Faces of Medicaid* analysis published by the Center for Health Care Strategies (CHCS), roughly 60 percent of Medicaid's highest-cost beneficiaries with disabilities were found to have co-occurring physical and behavioral health conditions.[2] Identifying specific clinical opportunities for Medicaid beneficiaries with multimorbidity, particularly those with behavioral health conditions, is critical for guiding state efforts to improve quality and control spending.

In Brief

Identifying Medicaid's highest-need, highest-cost beneficiaries who are most likely to benefit from care management is an ongoing conundrum for states. Previous *Faces of Medicaid* analyses from the Center for Health Care Strategies (CHCS) documented the high prevalence of comorbidity among Medicaid beneficiaries with disabilities. This new analysis by researchers at Johns Hopkins University provides an even clearer picture. The findings identify:

- High-priority patterns of multimorbidity based on hospitalization rates and costs;
- The impact of mental illness and substance abuse on per capita costs and hospitalization rates; and
- Significant opportunities for clinical interventions, including a companion online literature review that inventories promising care models for high-priority multimorbidity patterns.

The brief also outlines how states can apply provisions within the Patient Protection and Affordable Care Act (ACA) to develop more integrated models for beneficiaries with serious mental illness, chronic physical conditions, and substance disorders.

CHCS commissioned this latest *Faces of Medicaid* analysis by Johns Hopkins University researchers in order to examine multimorbidity patterns among adult Medicaid beneficiaries with disabilities and the implications of specific patterns on hospitalization and cost.[3] For the analysis, "multimorbidity pattern" was 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. Whereas previous analyses of multimorbidity in this series relied on the broad diagnostic categories used in the Chronic Illness and Disability Payment System (CDPS),[4] this report drills down to the diagnostic level to allow for greater clinical specificity focusing on 13 identified index conditions.[5] And, through a companion literature review, it provides actionable information to help Medicaid stakeholders design targeted strategies for high-priority patterns of multimorbidity.

The analysis confirms the overwhelming pervasiveness of physical and behavioral health comorbidity among Medicaid's highest-cost beneficiaries. Reinforcing earlier *Faces* analyses, the findings demonstrate that most beneficiaries with the highest hospitalization rates and costs have not one condition, but many. Mental illness is nearly universal among the highest-cost, most frequently hospitalized beneficiaries, and similarly, the presence of mental illness and/or drug and alcohol disorders is associated with substantially higher per capita costs and hospitalization rates. The findings confirm the need for programs that integrate physical and behavioral health care policies, programs, and service delivery.

Made possible through support from Kaiser Permanente.

STUDY DESIGN

CHCS partnered with researchers at Johns Hopkins University to conduct this analysis. The study used 2001 and 2002 data from the Medicaid Analytic eXtract (MAX) files; both years of data were used to determine morbidity profiles, whereas service use and expenditures were analyzed for 2002 only. The results presented in this brief focus on adults with disabilities under age 65 who are not eligible for Medicare. Individuals enrolled in managed care plans were excluded as were costs associated with long-term supports and services. Although the initial analysis also examined Medicaid expenditures and service use for the dual eligible population, these data are not reported here because without Medicare data, the portrait for duals would be incomplete. The analysis examined disease prevalence, health care costs, and utilization for a total of 5.2 million Medicaid beneficiaries. This data brief summarizes findings for a subset totaling approximately 1.9 million non-dual adults with disabilities under age 65.

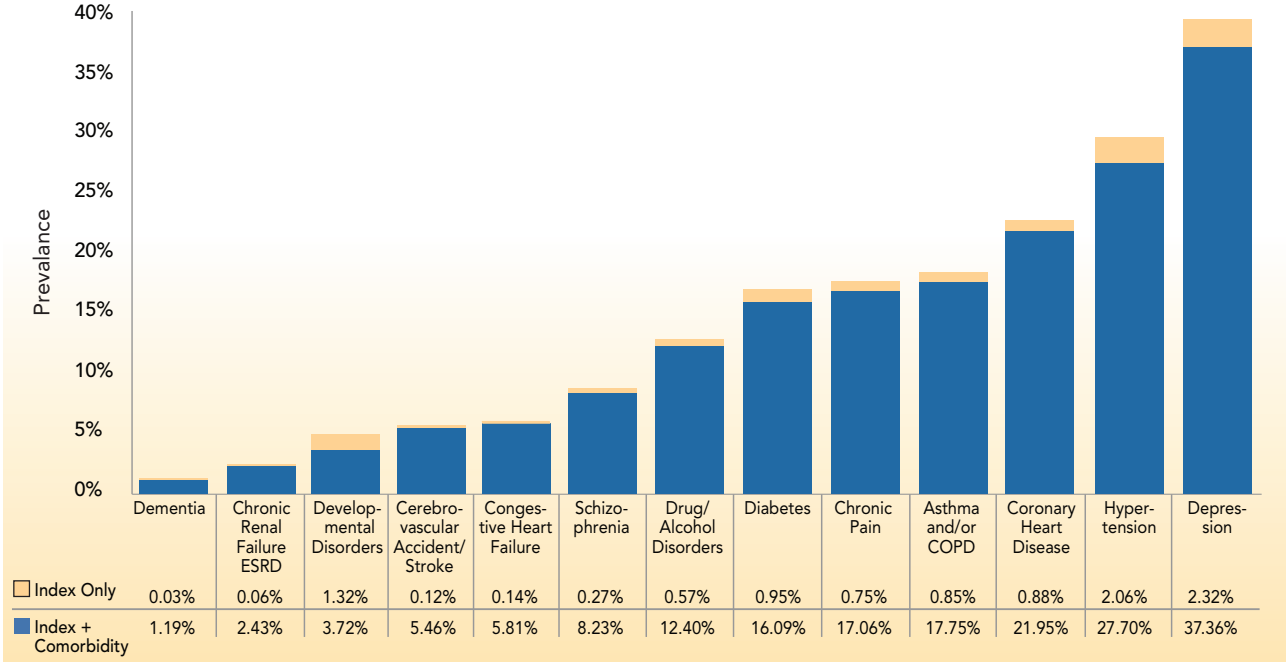
For this analysis, a "condition" was defined as a clinical entity that could be managed in a relatively homogenous manner. Prevalence of chronic conditions was determined based on the building blocks of the CDPS diagnostic classification framework as well as data from pharmacy and durable medical equipment claims. To identify high-priority multimorbidity patterns for targeting by Medicaid agencies and plans, the analysis identified 13 index conditions based on prevalence, potential for modification of clinical course, and costs of management. The 13 index conditions are: (1) asthma and/or chronic obstructive pulmonary disease (COPD); (2) cerebrovascular accident (stroke); (3) chronic pain; (4) congestive heart failure; (5) coronary heart disease; (6) dementia; (7) depressive disorders; (8) developmental disorders; (9) diabetes; (10) drug and alcohol disorders; (11) hypertension; (12) chronic renal failure or end stage renal disease; and (13) schizophrenia. To determine the set of associated conditions that could be considered in the pattern analysis for each index condition, the researchers identified the most common 15 from among 32 co-occurring clinical conditions. The researchers also considered five additional conditions based on either high per capita costs or the opportunities these conditions presented for the development of care management strategies that address distinct patterns of multimorbidity. There was a final narrowing of chronic conditions for the pattern analyses based jointly on prevalence and cost. Pattern analyses were used to identify prevalence of combinations of these conditions, associated costs and utilization patterns. For a full description of the study methodology, see the full report and appendices at **www.chcs.org**.

FINDINGS

The overwhelming majority of beneficiaries with the 13 identified index conditions have additional chronic conditions.

Beneficiaries with any one of the index conditions are extremely likely to have other co-occurring conditions. For most of the index conditions, fewer than one percent of beneficiaries have only the specified index condition (Figure 1). The only exceptions are for developmental disorders, hypertension, and depression – but even for these conditions, fewer than three percent of beneficiaries have only the index condition. The near universality of comorbidity across these index conditions highlights the need for care management strategies that explicitly acknowledge this clinical complexity.

Figure 1 | Frequency of Multimorbidity by Index Condition among Medicaid-Only Beneficiaries with Disabilities

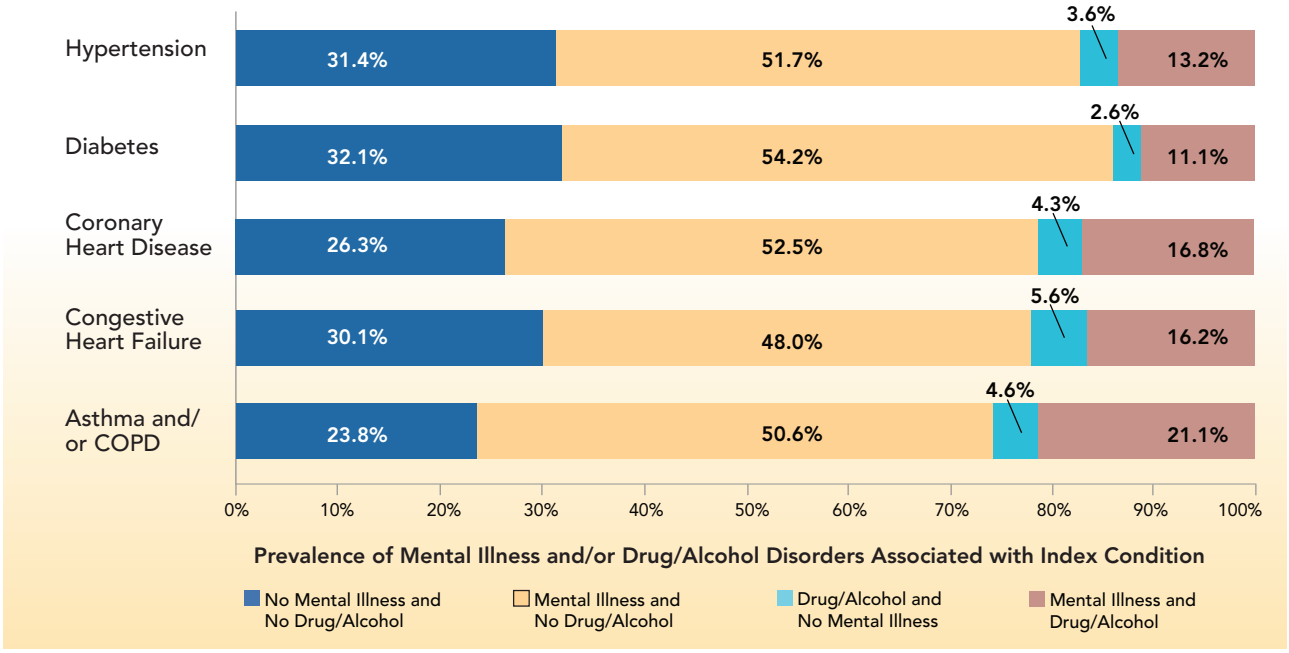


	Dementia	Chronic Renal Failure ESRD	Develop-mental Disorders	Cerebro-vascular Accident/ Stroke	Conges-tive Heart Failure	Schizo-phrenia	Drug/ Alcohol Disorders	Diabetes	Chronic Pain	Asthma and/or COPD	Coronary Heart Disease	Hyper-tension	Depres-sion
Index Only	0.03%	0.06%	1.32%	0.12%	0.14%	0.27%	0.57%	0.95%	0.75%	0.85%	0.88%	2.06%	2.32%
Index + Comorbidity	1.19%	2.43%	3.72%	5.46%	5.81%	8.23%	12.40%	16.09%	17.06%	17.75%	21.95%	27.70%	37.36%

Physical and behavioral health comorbidity is pervasive among Medicaid's highest-cost beneficiaries with disabilities.

Consistent with earlier *Faces of Medicaid* analyses by researchers at the University of California San Diego, for beneficiaries with one of five common chronic physical conditions — asthma/COPD, congestive heart failure, coronary heart disease, diabetes, or hypertension — approximately two-thirds also have a mental illness (Figure 2).[6] The prevalence of drug and alcohol disorders is also worth noting among this group – ranging from just under 17 percent for individuals with diabetes to nearly 26 percent for asthma/COPD. Moreover, up to one-fifth of people with one of these five chronic physical conditions also have both mental illness and a drug and alcohol disorder. Due to likely underreporting of drug and alcohol use, it is probable that these numbers are low. While behavioral health comorbidity has been previously recognized as an important issue for the Medicaid population, this research adds cost and utilization data to quantify the extent to which comorbid mental illness and drug and alcohol disorders affect patients with a broad array of chronic conditions.

Figure 2 | Prevalence of Behavioral Health Comorbidities among Medicaid-Only Beneficiaries with Disabilities



Health care spending is substantially higher for beneficiaries with chronic physical conditions who also have a mental illness and/or drug and alcohol disorder.

The addition of mental illness for those with common chronic physical conditions is associated with health care costs that are 60 to 75 percent higher than those without a mental illness (Figure 3). The addition of co-occurring mental illness and a drug and alcohol disorder for beneficiaries with common chronic physical conditions results in two- to three-fold higher health care costs. For example, spending for beneficiaries with diabetes and no mental illness and drug and alcohol disorder average just under $10,000 per year, whereas spending for beneficiaries with diabetes and a mental illness and drug and alcohol disorder tops $35,000 annually. Moreover, within 25 of the costliest multimorbidity patterns on a per capita basis, nearly all — 18 out of 25 — include behavioral health comorbidities (Figure 4); the number bumps up to 23 out of 25 when dementia is included as well.

Figure 3 | Impact of Behavioral Health Comorbidities on Per Capita Costs among Medicaid-Only Beneficiaries with Disabilities

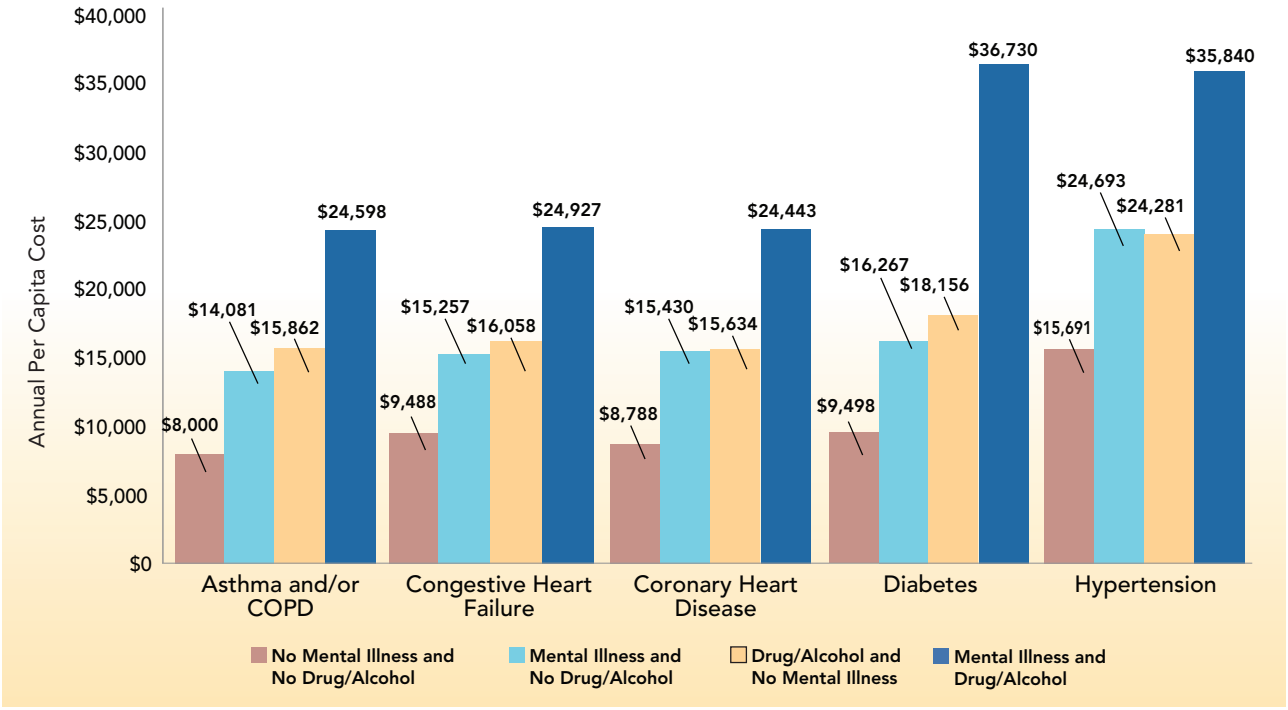


Figure 4 | Top 25 Multimorbidity Patterns by Per Capita Cost among Medicaid-Only Beneficiaries with Disabilities [a, b]

Multimorbidity Pattern [c, d, e]	Annual Per Capita Cost	Annual Per Capita Hospitalization Rate	Prevalence among Medicaid-Only Beneficiaries	Prevalence of High-Cost Cases in Morbidity Pattern[e]
1. Dementia, HIV/AIDS	$60,145	2.43	0.06%	69.0%
2. Asthma/COPD, Chronic Pain, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$58,617	4.23	0.09%	67.8%
3. Cerebrovascular Accident/Stroke, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$57,905	3.92	0.10%	67.9%
4. Chronic Pain, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$57,857	3.93	0.15%	68.1%
5. Asthma/COPD, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$53,985	3.97	0.16%	69.6%
6. Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$51,344	3.46	0.31%	69.3%
7. Asthma/COPD, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension	$50,618	3.70	0.21%	69.2%
8. Chronic Pain, Chronic Renal Failure/ESRD, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$50,327	3.32	0.25%	67.6%
9. Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension	$47,453	3.15	0.45%	68.2%
10. Chronic Renal Failure/ESRD, Congestive Heart Failure, Dementia, Hypertension	$45,342	2.92	0.55%	66.9%
11. Antipsychotic/Mood Stabilizer Drugs, Anxiety, Depression, Developmental Disorders, Intestinal Bleeding	$45,073	1.00	0.06%	60.6%
12. Chronic Renal Failure/ESRD, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$43,544	2.82	0.53%	65.9%
13. Antipsychotic/Mood Stabilizer Drugs, Anxiety, Asthma/COPD, Coronary Heart Disease, Depression, Drug/Alcohol Disorders, Hypertension, Schizophrenia, Spine Disorders	$42,055	4.80	0.08%	77.9%
14. Antipsychotic/Mood Stabilizer Drugs, Anxiety, Developmental Disorders, Intestinal Bleeding	$41,999	0.74	0.18%	50.8%
15. Antipsychotic/Mood Stabilizer Drugs, Anxiety, Depression, Developmental Disorders, Schizophrenia	$40,234	1.96	0.25%	72.3%
16. Chronic Renal Failure/ESRD, Coronary Heart Disease, Hypertension	$40,208	2.47	1.06%	60.7%
17. Antipsychotic/Mood Stabilizer Drugs, Anxiety, Depressive Disorders, Developmental Disorders	$40,093	1.11	0.65%	58.3%
18. Chronic Renal Failure/ESRD, Coronary Heart Disease, Dementia, Hypertension	$39,838	2.51	0.77%	62.8%
19. Drug and Alcohol Disorders, HIV/AIDS	$39,797	2.08	0.79%	70.7%
20. Cerebrovascular Accident/Stroke, Developmental Disorders, Mental Illness, Non-stroke Plegias and Palsies	$39,691	1.09	0.04%	51.6%
21. Asthma/COPD, Chronic Pain, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	$39,502	3.05	0.38%	72.5%
22. Chronic Renal Failure/ESRD, Dementia, Hypertension, Mental Illness	$39,212	2.41	0.77%	62.0%
23. Chronic Renal Failure/ESRD, Hypertension, Mental Illness	$39,113	2.31	1.10%	59.7%
24. Chronic Pain, HIV/AIDS	$38,748	1.54	0.61%	69.2%
25. Antipsychotic/Mood Stabilizer Drugs, Anxiety, Developmental Disorders, Schizophrenia	$38,654	1.67	0.32%	69.0%

a *SOURCE*: Johns Hopkins University analysis based on 2001-2002 Medicaid Analytic eXtract (MAX) files. The top 25 patterns were pulled from the subset of the population with the top five costliest multimorbidity patterns (in terms of aggregate costs) for each of 13 index conditions. Therefore, some multimorbidity patterns with high per capita costs may not have been considered for this table.

b Excludes single morbidity patterns.

c Each multimorbidity pattern represents individuals with the conditions listed in the pattern. These individuals may also have any of the following co-occurring conditions depending on what was examined for each index condition: anticoagulation drugs (warfarin), antiepileptic drugs, antipsychotic or mood stabilizer drugs, asthma and/or chronic obstructive pulmonary disease, back or spine disorders, cerebrovascular accident/stroke, chronic pain, chronic renal failure/ESRD, congestive heart failure, continuous positive airway pressure machine, coronary heart disease, dementia, developmental disorders, diabetes, dizziness, drug and alcohol disorders, electrolyte imbalance, gastrointestinal bleed, hepatitis or chronic liver disease, HIV or AIDs, home oxygen therapy, in-home hospital bed use, hypertension, neurologic disorders, non-stroke plegias and palsies, obesity, and prednisone use. Psychiatric disorders include schizophrenia, bipolar affective disorder, major depressive disorder, anxiety disorder, and personality disorder; this grouping was used with individual index conditions that were considered primarily "medical" in nature. See the "Multimorbidity Pattern Analyses and Clinical Opportunities" tables for each index condition at http://www.chcs.org/publications3960/publications_show.htm?doc_id=1261203&inactive=1 for a targeted list of co-occurring conditions.

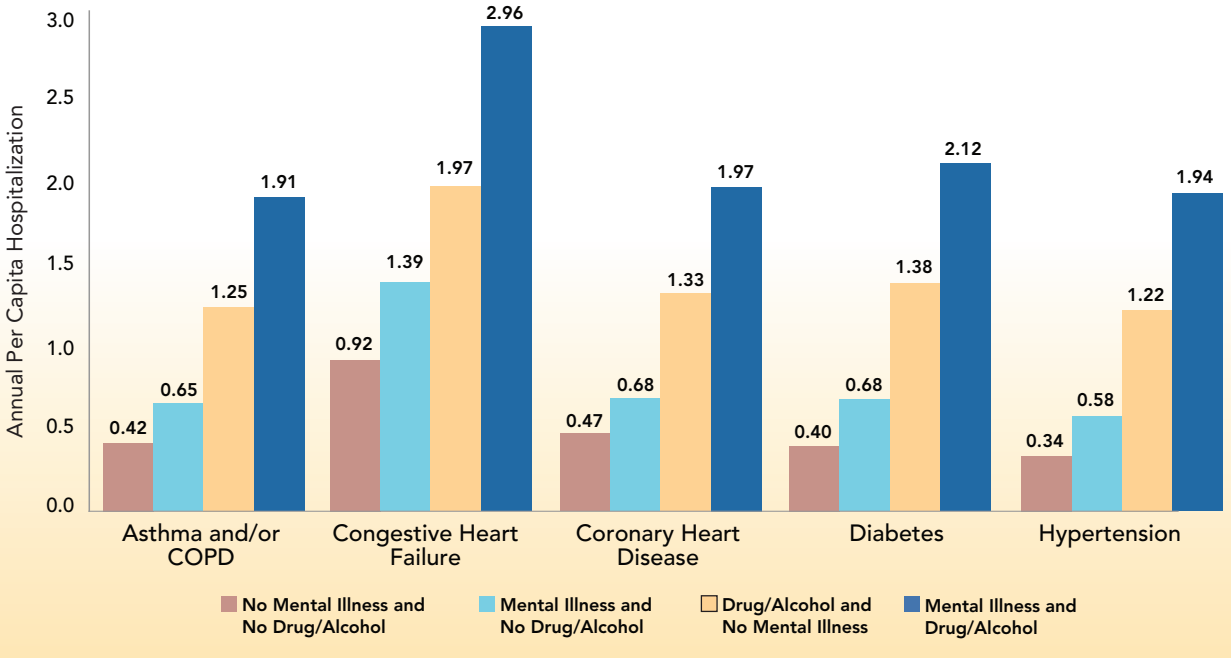
d All measures of cost exclude long-term care costs.

e "High-cost cases" refers to individuals that are among the top 20% of Medicaid-only disabled beneficiaries by total costs (excluding long-term care costs).

Beneficiaries with chronic physical conditions are more likely to be hospitalized when they have a mental illness and/or drug and alcohol disorder.

Among the 25 multimorbidity patterns with the highest hospitalization rates from among those conditions studied, 88 percent include behavioral health comorbidities (100 percent when dementia is included as a behavioral health comorbidity). The addition of mental illness for adults with one of five common chronic physical conditions — asthma, coronary heart disease, asthma, diabetes, or congestive heart failure — is associated with increases in hospitalization rates ranging from 46 percent for congestive heart failure to more than 70 percent for hypertension (Figure 5). The combination of mental illness and drug and alcohol disorder is linked to even higher hospitalization rates. Beneficiaries with asthma, coronary heart disease, asthma, diabetes, or congestive heart failure and co-occurring mental illness and drug and alcohol disorder are four to five times more likely to be hospitalized than those with only physical conditions.

Figure 5 | Impact of Behavioral Health Comorbidities on Per Capita Hospitalization among Medicaid-Only Beneficiaries with Disabilities



Consistent relationships emerge when comparing the top 25 multimorbidity patterns with the highest-costs and highest-hospitalization rates. Not surprisingly, 12 of the top 25 patterns by costs also appear in the top 25 patterns by hospitalization rates (Figure 6). Index conditions most commonly represented across these 12 highest-cost, highest-hospitalization patterns include: coronary heart disease (11); dementia (11); hypertension (11); chronic renal failure/ end stage renal disease (10); mental illness (9); and congestive heart failure (8). Of the 12 highest-cost patterns not represented in the highest-hospitalization patterns, six include developmental disorders, and another three include HIV/AIDS.

Figure 6 | Top 25 Multimorbidity Patterns by Annual Per Capita Hospitalizations among Medicaid-Only Beneficiaries with Disabilities [a]

Multimorbidity Pattern [b, c, d]	Annual Per Capita Hospitalization Rate	Annual Per Capita Cost	Prevalence among Medicaid-Only Beneficiaries	Prevalence of High-Cost Cases in Morbidity Pattern[d]
1. Antipsychotic/Mood Stabilizer Drugs, Anxiety Disorders, Asthma/COPD, Coronary Heart Disease, Depression, Drug/Alcohol Disorders, Hypertension, Schizophrenia, Spine Disorders	4.80	$42,055	0.08%	77.9%
2. Asthma/COPD, Chronic Pain, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	4.23	$58,617	0.09%	67.8%
3. Asthma/COPD, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	3.97	$53,985	0.16%	69.6%
4. Antipsychotic/Mood Stabilizer Drugs, Anxiety Disorders, Depression, Drug/Alcohol Disorders, Personality Disorder, Schizophrenia	3.95	$37,695	0.30%	73.5%
5. Chronic Pain, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	3.93	$57,857	0.15%	68.1%
6. Cerebrovascular Accident/Stroke, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	3.92	$57,905	0.10%	67.9%
7. Asthma/COPD, Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension	3.70	$50,618	0.21%	69.2%
8. Antipsychotic/Mood Stabilizer Drugs, Anxiety Disorders, Depression, Drug/Alcohol Disorders, Hypertension, Schizophrenia	3.55	$35,580	0.47%	75.0%
9. Antipsychotic/Mood Stabilizer Drugs, Anxiety Disorders, Asthma/COPD, Depression, Drug/Alcohol Disorders, Schizophrenia	3.51	$35,509	0.49%	76.0%
10. Chronic Renal Failure/ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	3.46	$51,344	0.31%	69.3%
11. Chronic Pain, Chronic Renal Failure/ ESRD, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	3.32	$50,327	0.25%	67.6%
12. Antipsychotic/Mood Stabilizer Drugs, Anxiety Disorders,Asthma/COPD, Chronic Pain, Coronary Heart Disease, Depression, Drug/Alcohol Disorders, Hypertension, Spine Disorders	3.24	$36,751	0.20%	75.0%
13. Chronic Renal Failure/ ESRD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension	3.15	$47,453	0.45%	68.2%
14. Antipsychotic/Mood Stabilizer Drugs, Asthma/COPD, Depression, Drug/Alcohol Disorders, Schizophrenia	3.05	$33,363	0.68%	73.4%
15. Asthma/COPD, Chronic Pain, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	3.05	$39,502	0.38%	72.5%
16. Asthma/COPD, Chronic Pain, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness, Spine Disorders	3.01	$37,601	0.22%	72.3%
17. Chronic Renal Failure/ESRD, Congestive Heart Failure, Dementia, Hypertension	2.92	$45,342	0.55%	62.8%
18. Cerebrovascular Accident/Stroke, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	2.85	$38,507	0.36%	67.7%
19. Chronic Renal Failure/ESRD, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	2.82	$43,544	0.53%	65.9%
20. Asthma/COPD, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	2.79	$35,796	0.74%	69.9%
21. Chronic Pain, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness	2.79	$38,058	0.59%	70.0%
22. Antipsychotic/Mood Stabilizer Drugs, Anxiety Disorders, Depressive Disorders, Drug/Alcohol Disorders, Schizophrenia	2.79	$30,668	1.10%	70.2%
23. Asthma/COPD, Drug/Alcohol Disorders, Mental Illness, Schizophrenia	2.77	$31,149	0.87%	69.0%
24. Chronic Pain, Congestive Heart Failure, Coronary Heart Disease, Dementia, Hypertension, Mental Illness, Spine Disorders	2.75	$35,855	0.32%	70.3%
25. Asthma/COPD, Chronic Pain, Coronary Heart Disease, Drug/Alcohol Disorders, Hypertension, Mental Illness, Spine Disorders	2.73	$31,629	0.45%	68.9%

a *SOURCE:* Johns Hopkins University analysis based on 2001-2002 Medicaid Analytic eXtract (MAX) files. The top 25 patterns were pulled from the subset of the population with the top five costliest multimorbidity patterns for each of 13 index conditions. Therefore, some multimorbidity patterns with high hospitalization rates may not have been considered for this table.

b Excludes single morbidity patterns.

c Each multimorbidity pattern represents individuals with the conditions listed in the pattern. These individuals may also have any of the following co-occurring conditions depending on what was examined for each index condition: anticoagulation drugs (warfarin), antiepileptic drugs, antipsychotic or mood stabilizer drugs, asthma and/or chronic obstructive pulmonary disease, back or spine disorders, cerebrovascular accident/stroke, chronic pain, chronic renal failure/ESRD, congestive heart failure, continuous positive airway pressure machine, coronary heart disease, dementia, developmental disorders, diabetes, dizziness, drug and alcohol disorders, electrolyte imbalance, gastrointestinal bleed, hepatitis or chronic liver disease, HIV or AIDs, home oxygen therapy, in-home hospital bed use, hypertension, neurologic disorders, non-stroke plegias and palsies, obesity, and prednisone use. Psychiatric disorders includes schizophrenia, bipolar affective disorder, major depressive disorder, anxiety disorder, and personality disorder; this grouping was used with individual index conditions that were considered primarily "medical" in nature. See the "Multimorbidity Pattern Analyses and Clinical Opportunities" tables for each index condition at http://www.chcs.org/publications3960/publications_show.htm?doc_id=1261203&inactive=1 for a targeted list of co-occurring conditions.

d All measures of cost exclude long-term care costs.

e "High-cost cases" refers to individuals that are among the top 20% of Medicaid-only disabled beneficiaries by total costs (excluding long-term care costs).

A LOOK AT THE PEOPLE IN THE PATTERNS

The following patient stories, based on a composite of actual consumers treated by clinicians at Johns Hopkins, illustrate the implications of multimorbidity from the patient and provider perspectives. Both of these examples represent patterns within the most frequently hospitalized population subsets uncovered in this analysis.

Case 1

Ms. V, age 59, has a history of hypertension and diabetes, and has smoked two packs of cigarettes daily for the last 30 years, causing chronic obstructive pulmonary disease (COPD). Three years ago, she suffered a major heart attack and developed congestive heart failure. She used to be a bus driver, but is unable to work due to heart failure and COPD and qualified for Medicaid two years ago. She is often short of breath, but is unable to tell if it is due to her lung or heart problems, or some combination. She frequently forgets to check her sugars four times daily or simply skips doing so because it is "a bother." She finds it nearly impossible to follow diet advice given to her by multiple doctors because she feels there is nothing left to eat after eliminating sugar, salt, and high-cholesterol foods from her diet.

Despite her health challenges, she often cares for her grandson, sometimes overnight. She was hospitalized three times in the past year for shortness of breath due to exacerbations of congestive heart failure and COPD. With each discharge, her medicine list has grown longer, but since the discharge instructions are often unclear, she has continued to take her medicines as she did prior to admission. She has gotten depressed and anxious, and was put on a low dose antidepressant. Yet, because she does not think it is working, she often does not take it. A family physician tries to coordinate her care, but her cardiologist and pulmonologist work in a different health system so communication among her physicians is sporadic, at best.

Case 2

Mr. G, age 42, was diagnosed with schizophrenia in his 20s, has also struggled with alcohol abuse and major depression, and has had asthma since childhood. In the last year, he has had three emergency department visits and two inpatient hospitalizations, one due to asthma and the other for a gastrointestinal bleed resulting from his alcohol abuse. He usually lives with his sister, but sometimes lives on the streets and has not been able to maintain steady employment.

He often feels depressed and experiences psychotic symptoms when he forgets or neglects to take his schizophrenia medications. He does not like his community mental health clinic and instead prefers his primary care physician. Unfortunately, his primary care physician is overwhelmed by Mr. G's psychiatric issues, and tends to focus on his asthma and the medical consequences of his alcohol abuse. The physician is frustrated by her busy schedule, which makes it difficult to manage Mr. G's psychiatric issues during 15-minute visits, and by Mr. G's inability to adhere to the prescribed asthma regimen in the face of his psychiatric issues.

Commentary

Multiple chronic conditions pose significant challenges for patients like Ms. V and Mr. G and their health care providers. In a health care system that tends to focus on the care of patients with single conditions, it is critical to understand two key concepts. First, focusing on any one of these patients' conditions in the absence of the others will likely lead to suboptimal treatment. Second, it is the *specific* combination of conditions experienced by a patient that drives morbidity, costs, and health service utilization.

For Ms. V, who struggles with difficult-to-follow diet instructions from multiple physicians, it would be useful for her to understand the most important changes she should make and how to achieve success on her own terms. Further, tailored and integrated patient education could help her understand when shortness of breath is due primarily to her heart failure as opposed to COPD; more active management of her depression and anxiety could improve her adherence to diet and medication instructions; and reducing the number of times each day she must check her blood sugars might make her more inclined to check when necessary. Finally, focusing on transitions in care between outpatient providers and hospitals would help minimize unnecessary medication changes.

For Mr. G, it would be useful to have an integrated clinical approach that specifically addresses the challenges posed by patients like him who struggle with serious mental illness and significant medical conditions. Fortunately, interventions are available including care management programs for patients with asthma and depression; integrated treatment approaches for patients with co-existing severe mental health and substance abuse problems; primary care collaborative models for patients with chronic medical conditions and depression such as IMPACT; as well as numerous schizophrenia care management programs that could be adapted for patients with multimorbidity. Effective intervention would also facilitate collaboration between his primary care physician and his behavioral health specialist (psychiatrist) to make sure his schizophrenia is effectively managed and that his physical and behavioral health care are coordinated.

Resources to Guide Care Management Design

Ms. V and Mr. G represent high-priority multimorbidity patterns within the Medicaid population. For a body of evidence that describes clinical approaches and models for these multimorbidity patterns and other specific patient subsets, see the set of *Multimorbidity Pattern and Clinical Opportunities Tables* at **www.chcs.org**.

A sizeable evidence base is growing, suggesting interventions that go beyond single disease management to address specific multimorbidity patterns.

To guide Medicaid stakeholders in translating high-priority multimorbidity patterns into actionable opportunities, the Johns Hopkins researchers performed a literature review to uncover promising interventions linked to particular multimorbidity patterns. The literature review identified clinical opportunities within the following categories:

1. Evidence-based clinical "pearls" that address a particular aspect of care for a specific multimorbidity pattern;
2. Single-disease focused care delivery models relevant to the care of multimorbid patients;
3. Evidence-based models for the specific multimorbidity patterns; and
4. Clinical practice guidelines and systematic reviews.

In addition to highlighting high-priority intervention opportunities for some multimorbidity patterns, the literature review also identified gaps in the knowledge base around the clinical management of other high-priority combinations of conditions. For example, whereas a broad range of interventions was found for depression and co-occurring conditions, fewer interventions were found for chronic pain and co-occurring conditions. And lastly, the literature search also uncovered generalized evidence-based models that are not condition specific. These models could be helpful in the development of care management initiatives targeted to beneficiaries with diverse and heterogeneous clinical needs.

Of note, since the Hopkins researchers did not perform a formal review of the quality of the studies included in the evidence review, the quality of the evidence is undoubtedly variable. However, given the serious evidence gaps to guide the care of patients with multimorbidity, this literature may provide valuable information to help guide the development of innovative programs to improve care delivery for these patients.

Notably, the inventory of general evidence-based models for addressing multimorbidity reveals a set of common elements that are prevalent across effective models. These include: (1) risk assessment; (2) multidimensional assessment: (3) use of non-physician health professionals when appropriate for care delivery; (4) use of enabling technology, such as telemedicine; (5) targeting several key clinical outcomes that transcend one particular disease; and (6) use of transitional care components. Ensuring that these elements, or a subset thereof, are present in care models for complex populations is a key takeaway for those designing Medicaid care management approaches.

Targeting Clinical Opportunities within Medicaid Populations: Online Resources

In tandem with this policy brief, CHCS together with its partners at Johns Hopkins have developed a variety of online resources to support Medicaid stakeholders in more effectively targeting interventions for high-need, high-cost beneficiaries. In addition to the full report from the Johns Hopkins research team that offers a more in-depth description of the analysis of multimorbidity patterns, materials include:

Multimorbidity Pattern Analyses and Clinical Opportunities Tables — Resources include:

- Summary tables detailing the five most costly patterns for each index condition;
- Data tables for the 16 most common multimorbidity patterns identified for each index condition, including prevalence, utilization, and expenditure data for each; and
- Clinical opportunities tables that catalog promising clinical models for specific patterns of multimorbidity. An alphabetical listing of citations for all the studies listed in the clinical opportunities tables is also available.

Evidence-Based Clinical Models Not Specific to a Multimorbidity Pattern — This literature review provides a summary of clinical models that have been developed and tested for patients with multimorbidity, regardless of the specific underlying conditions. The identified models are grouped within the following categories: interdisciplinary primary care teams; care/case management; preventive home visits; outpatient comprehensive geriatric assessment and geriatric evaluation and management; pharmaceutical care; chronic disease self-management; proactive rehabilitation; transitional care; hospital at home; nursing home; and Medicaid-specific studies.

Visit **www.chcs.org** to download these resources.

POLICY IMPLICATIONS

With disproportionate resources incurred by Medicaid's highest-need, highest-cost beneficiaries, states are inherently interested in new strategies to improve care and reduce unnecessary utilization for these individuals. While states recognize the predominance of mental illness and substance abuse among this high-need population, most lack a clear picture of who exactly these beneficiaries are, including their specific health needs and costs, and where to invest resources for the greatest potential to improve care. This analysis offers states critical information to help quantify the costs and utilization of beneficiaries with multiple comorbidities and pinpoint specific opportunities for care improvement.

By quantifying the costs and utilization of beneficiaries with multiple comorbidities and pinpointing specific opportunities for care improvement, this analysis offers states critical information for designing more effective care management strategies.

In particular, the findings emphasize the overwhelming impact of mental illness on per capita costs and hospitalization rates. The addition of drug and alcohol disorders to mental illness impacts costs and hospitalization rates even more substantially.

Many states already recognize the pervasiveness of co-occurring mental illness and drug and alcohol disorders and are pursuing efforts to more effectively integrate physical, behavioral health, and substance abuse services. Promising approaches being tested by states include: (1) promoting the use of multi-disciplinary care teams for individuals with complex needs, including primary care clinicians (nurse practitioners or registered nurses), behavioral health specialists, and community health workers/peer support specialists; (2) requiring information exchange across physical and behavioral systems, including payors and providers; and (3) aligning financial incentives across systems, e.g., performance incentives that encourage integration or establish gain-sharing mechanisms.

To bolster state efforts, the Patient Protection and Affordable Care Act (ACA) includes a number of key provisions that can be used to advance physical and behavioral health integration. Principal among these is Section 2703 that provides enhanced federal match and planning grants to establish health homes, an emerging vehicle for creating meaningful linkages between physical and behavioral health care providers.[7] Other relevant ACA opportunities include support for community-health teams; co-location of primary care clinicians in community mental health settings; and additional demonstrations that could come out of the newly created Center for Medicare and Medicaid Innovation. Health reform legislation also promotes state pilot efforts to test accountable care organizations (ACOs), a new care delivery model in which all providers – primary and behavioral health care, hospitals, etc. – share responsibility, risk, and ultimately, part of the potential cost savings achieved through improved care coordination and reduced utilization.

These new opportunities offer considerable federal resources to assist states in rethinking care delivery for individuals with a complex array of chronic physical and behavioral needs and substance use issues. As health reform extends Medicaid eligibility to 16-20 million additional beneficiaries in 2014, states will have to develop the capacity to nimbly assess the needs of newly-eligible adult high-risk populations and design responsive care management programs. Based on the experiences of existing state coverage programs for newly eligible adults, it is likely that many individuals in the expansion population will have multiple chronic conditions, including high rates of mental illness and substance abuse.[8] Thus, the highest-need, highest-cost segment of the expansion population may look very similar to the current Medicaid adult population with disabilities. Designing delivery systems that can accommodate the complexity of physical conditions, mental illness and substance abuse for both Medicaid's current and new beneficiaries will be critical.

AREAS FOR FURTHER STUDY

This analysis adds significantly to the knowledge base regarding high-priority multimorbidity patterns within Medicaid populations and their relationship to costs and hospitalization rates. It also assembles existing literature on care for multimorbid patients. Complementing this study, an additional CHCS *Faces of Medicaid* analysis, conducted in partnership with researchers at the University of California, San Diego, closely examines hospital readmission rates among Medicaid beneficiaries to shed light on potential opportunities to improve care and reduce avoidable hospitalizations.[9] This recent analysis explores the influence on readmission rates of individual and combinations of physical and behavioral health conditions.

Both this analysis and the readmissions study noted above point to the need to provide similar clarity on Medicaid's dual eligible population. As noted earlier, the Johns Hopkins analysis also examined Medicaid data for the duals, including those under age 65, but because Medicare data were not readily available, the findings are not reported herein. Nonetheless, the examination of Medicaid data alone for the dual eligible population uncovered a number of examples of high-priority multimorbidity patterns based on high per capita annual expenditures, such as dementia among aged duals with congestive heart failure or chronic pain among disabled duals with congestive heart failure. A recent analysis from the Kaiser Family Foundation that used linked Medicare and Medicaid data found that roughly 38 percent of duals have both physical and behavioral health conditions, compared to only 17 percent of all non-dual Medicare beneficiaries.[10] Additional analysis could combine Medicare and Medicaid data to further delve into multimorbidity patterns and high-priority areas of opportunity to improve care for dually eligible beneficiaries.

For beneficiaries with intensive long-term supports and services needs, an important issue emerging from this analysis is that long-term care claims commonly lack any diagnostic codes, limiting the potential to identify multimorbidity among this population. This suggests that the opportunity to improve cost and quality outcomes in this high-cost group may lie in understanding trajectories into long-term care, as well as understanding diagnostic information collected across other types of services and / or payors (e.g., Medicare for duals) or from other sources, such as the Minimum Data Set (MDS) that contains better data on diagnoses. Overlaying Medicaid data on long-term supports and services utilization and costs for the dually eligible population is another potential area of inquiry.

In sum, by enhancing care for Medicaid's highest-need, highest-cost subsets, states can potentially achieve not only better outcomes, but also substantial cost savings through more efficient care and reduced utilization. The identification of high-priority multimorbidity patterns gives Medicaid another tool for targeting interventions to those with the greatest health care needs.

Endnotes

[1] Kaiser Commission on Medicaid and the Uninsured and Urban Institute estimate based on 2004 MSIS data.

[2] R.G. Kronick, M. Bella, and T.P. Gilmer. *The Faces of Medicaid III: Refining the Portrait of People with Multiple Chronic Conditions*. Center for Health Care Strategies, Inc., October 2009.

[3] C. Boyd, B. Leff, C. Weiss, J. Wolff, R. Clark, and T. Richards. *Full Report: Clarifying Multimorbidity to Improve Targeting and Delivery of Clinical Services for Medicaid Populations*. Center for Health Care Strategies, Inc., December 2010. For the full analysis and corresponding materials, visit www.chcs.org.

[4] CDPS is a diagnostic classification system that is used by a variety of Medicaid programs to make health-based capitated payments to managed care organizations for TANF populations and beneficiaries with disabilities. For information, see: R. Kronick, T. Gilmer, T. Dreyfus, and L. Lee. "Improving Health-Based Payment for Medicaid Beneficiaries: CDPS." *Health Care Financing Review*, Spring 2000, 21(3):29-64.

[5] For a full description of study methodology, see C. Boyd, et al., op. cit., available at www.chcs.org.

[6] R.G. Kronick, et al., op. cit.

[7] Section 2703. State Option to Provide Health Homes for Enrollees with Chronic Conditions. This provision allows a state plan amendment option to provide for medical assistance to eligible individuals with chronic conditions who select a designated provider, a team of health care professionals operating with such a provider, or a health team as the individual's health home.

[8] S.A. Somers, A. Hamblin, J.M. Verdier, and V.L.H. Byrd. *Covering Low-Income Childless Adults in Medicaid: Experiences from Selected States*. Center for Health Care Strategies, Inc., August 2010.

[9] T. P. Gilmer and A. Hamblin. *Analysis of Hospital Readmissions among Medicaid Beneficiaries with Disabilities: Identifying Targets of Opportunity*. Center for Health Care Strategies, Inc., December 2010.

[10] J. Kasper, M. O'Malley Watts, and B. Lyons. "Chronic Disease and Comorbidity among Dual Eligibles: Implications for Patterns of Medicaid and Medicare Service Use and Spending." Kaiser Commission on Medicaid and the Uninsured, July 2010.

Additional Resources

Clarifying Multimorbidity Patterns to Improve Targeting and Delivery of Clinical Services for Medicaid Populations is one of a number of tools being produced by the Center for Health Care Strategies (CHCS) through the *Rethinking Care Program*. This national initiative, made possible by Kaiser Permanente, was developed by CHCS to design and test better approaches to care for Medicaid's highest-need, highest-cost beneficiaries. The initiative is linking state pilot demonstrations — currently underway in Colorado, Pennsylvania, New York, and Washington — with a national learning network committed to advancing Medicaid's capacity to serve these "high-opportunity" beneficiaries.

For more information about the *Rethinking Care Program*, as well as tools for improving care management for Medicaid beneficiaries with complex needs, visit **www.chcs.org**.

About the Center for Health Care Strategies

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 people 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. For more information, visit **www.chcs.org**.

About the *Johns Hopkins Center on Aging and Health Program in Geriatrics Health Services Research*

The *Program in Geriatrics Health Services Research* is dedicated to patient-oriented and health services research that will further define and improve the health and well-being of older adults and the development of the next generation of systems of health care delivery. It seeks to foster interdisciplinary research essential for an aging population, to train research and policy leaders and to translate this work into practice to improve the health of older adults and the health care delivery system in which they receive care.

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