The Faces of Medicaid III:

Refining the Portrait of People with Multiple Chronic Conditions

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We are indebted to the visionary leadership at Kaiser Permanente for recognizing the need to uncover the "faces" of Medicaid's highest-need populations. In particular, Ray Baxter has been a critical supporter of our work to develop more effective ways to care for Medicaid's most complex need beneficiaries. We also recognize Dave Baugh and William Clark at the Centers for Medicare and Medicaid Services for providing access to the MAX data for this analysis. At CHCS, Stephen Somers and Allison Hamblin provided valuable feedback in the design of the analysis and presentation of the findings and Michael Canonico helped with final packaging of the report. And lastly, we applaud the pioneering efforts of Medicaid stakeholders in Colorado, New York, Pennsylvania, and Washington State who are piloting innovative approaches for high-need, high-cost beneficiaries through CHCS' *Rethinking Care Program*. It is our hope that the findings herein inspire and guide additional states in designing more accountable systems of care for adults with chronic physical and serious mental illness.

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R.G. Kronick, M. Bella, 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.

Foreword

The Center for Health Care Strategies (CHCS) is pleased to publish this latest issue in its *Faces of Medicaid* series with ongoing support from Kaiser Permanente and the Robert Wood Johnson Foundation. Each iteration has brought warranted attention to the complexity of Medicaid's high-need, high-cost populations and the challenges inherent in designing cost-effective systems of care for them. The *Faces* reports have helped drive CHCS' efforts to rethink care for these beneficiaries through its policy analyses, technical assistance, and rigorous state-based research and demonstration projects.

In the spirit of continuous learning, we are excited to publish *Faces of Medicaid III*. With the insightful analysis of Rick Kronick and Todd Gilmer, our research partners at the University of California, San Diego (UCSD), we now have a clearer and more compelling picture of the aged, blind, and disabled (ABD) population that reveals materially higher prevalence rates for behavioral health and cardiovascular disease, as well as increased rates of comorbidity. The original *Faces II* examined one year of diagnostic data for adult Medicaid beneficiaries and, in so doing, began to identify prevalence and patterns of chronic conditions within this high-need population. This new analysis adds two sets of data — one year of pharmacy claims and four years of diagnostic data — and provides two separate analyses of these data sets. With the addition of pharmacy data, the number of beneficiaries with three or more chronic conditions increases from 35% to 45% in comparison to the *Faces II* analysis. In expanding the original diagnostic data set from one year to five years of data, the percentage of individuals with three or more chronic conditions rises even more dramatically.

It is well known that a small subset of Medicaid's more than 60 million beneficiaries has demanding and costly health care needs. Developing a clearer picture of these individuals is a complicated task for states and health plans responsible for managing care for millions of beneficiaries. We commend our research partners at UCSD for their skillful examination of the data on Medicaid's highest-need, highest-cost beneficiaries. As a next step, CHCS plans to work with them to investigate readmission rates for this population in order to help identify the relationship between specific clusters of comorbidity and the likelihood of readmission. We are also planning further study to investigate opportunities for improving care for adults who have physical comorbidities along with serious mental illness.

We trust that others in the field will find this latest analysis, and, these future research directions, as exciting as we do. More importantly, we hope that these findings will help state and federal policymakers, and those who are redesigning programs at the ground level, create better systems of care for these beneficiaries.

Stephen A. Somers, PhD
President and CEO, Center for Health Care Strategies

Faces III: Key Findings

Pharmacy Data Analysis

Adding pharmacy data to the diagnostic data used in the earlier *Faces II* analysis considerably enhances the picture of complex comorbidities among Medicaid beneficiaries with disabilities. Following are key findings:

- The addition of pharmacy data increases the proportion of Medicaid beneficiaries with disabilities diagnosed with three or more chronic conditions from 35% to 45% over diagnostic data alone.

- Adding pharmacy data to diagnostic data significantly increases the frequency of psychiatric illness among Medicaid beneficiaries with disabilities from 29% to 49% versus solely looking at diagnostic data. Similarly, the prevalence of cardiovascular disease increases from 32% to 44%.

- With the addition of pharmacy data, costs for Medicaid-only beneficiaries with three or more chronic conditions increase from 66% to 75% of total spending for beneficiaries with disabilities.

- With the addition of pharmacy data, psychiatric illness is represented in three of the top five most prevalent pairs of diseases, or dyads, among the highest-cost 5% of Medicaid-only beneficiaries with disabilities; in looking at diagnostic data alone, psychiatric illness was not among the top five pairs.

- A few pairs of diagnoses demonstrate strong correlations, which were strengthened by the addition of pharmacy data. For example, 82% of Medicaid-only beneficiaries with disabilities diagnosed with diabetes also have cardiovascular disease, representing a nearly 25% increase in prevalence when pharmacy data are used in addition to diagnostic data.

Five-Year Diagnostic Data Analysis

Examining five years of diagnostic data results in even larger increases in the proportion of beneficiaries who are identified with multiple comorbidities, in particular:

- With five years of diagnostic data, two-thirds (67%) of Medicaid-only beneficiaries with disabilities have three or more chronic conditions, more than twice the 29% identified when only one year of data are used.

Understanding the "faces" of Medicaid's complex subsets is critical to designing, implementing and financing programs that can improve quality and bend the cost trend.

Introduction

In Medicaid, the elderly and adults with disabilities make up only 25 percent of beneficiaries, but account for a majority of program spending. Within this population, fewer than 5% of beneficiaries account for more than 50% of overall Medicaid costs.[1] Most of these high-cost beneficiaries — many of whom have multiple chronic physical and behavioral health conditions — receive care within an unmanaged fee-for-service delivery system, and the majority of them would benefit greatly from more integrated systems of care. By better understanding the specific health conditions of these beneficiaries, states can make more informed decisions about how to best manage care, thereby improving health outcomes, increasing quality of life, and controlling program costs.

This third edition of the *Faces of Medicaid (Faces of Medicaid III)* was commissioned by CHCS to provide a more comprehensive view of beneficiaries with multiple chronic conditions, particularly those with serious mental illness. It builds on the earlier *Faces of Medicaid II* analysis published in 2007, which sought to answer two key questions: (1) what is the prevalence of chronic conditions within the Medicaid population; and (2) are there patterns or clusterings of these conditions that could inform the development of more appropriate guidelines, care models, performance measurement systems, and reimbursement methodologies?[2] This new edition examines two powerful new data sources — one year of pharmacy claims and five years of diagnostic data — to further refine the portrait of Medicaid beneficiaries.

The earlier *Faces II* analysis revealed that many Medicaid beneficiaries with disabilities have multiple chronic conditions and that Medicaid's highest-cost beneficiaries have numerous comorbidities and account for a majority of total Medicaid expenditures. The initial analysis also found that while there were some diagnostic pairs — e.g., diabetes and cardiovascular disease, cardiovascular and pulmonary disease, etc. — that were commonly associated at relatively high levels, for the most part there was not a strong relationship across diagnoses among people with disabilities. This last finding was surprising to some who expected to find, for instance, that people with various physical illnesses (such as diabetes) were substantially more likely than others to also have behavioral health problems.

Author Interview

Perspectives on Combining the Pharmacy Data with the Five-Year Diagnostic Data Set

To get a clearer picture of Medicaid beneficiaries with complex conditions, *Faces III* includes two separate analyses examining: (1) one year of diagnostic and pharmacy data (2002); and (2) five years of diagnostic data (2001-2005) without pharmacy information. The researchers asked themselves during the course of their analysis whether the extra effort required to merge the drug data with the five-year diagnostic data set would be worth the value it might add to the findings. CHCS spoke with lead UCSD investigator Rick Kronick, PhD, (RK) to get his perspective.

CHCS: Why didn't you choose to combine the two data sets?

RK: After considering the logistical challenges, we decided that merging the data sets wouldn't have added sufficient value over and above what we were able to report without doing so.

CHCS: Recognizing that we are asking you to engage in pure speculation, what might you have found if you had combined the analyses?

RK: If we added drug data to the five-year data, I'd expect a modest increase in psychiatric illness — perhaps from 48% in the five-year data to 55%-65% in the five-year plus drug data, and a small increase in cardiovascular disease — perhaps from 48% to 52%-57%. The proportion of beneficiaries with three or more chronic conditions would probably also increase, from 67% in the five-year data to, perhaps, 70% or so.

CHCS: Again, pure speculation, but do you think policymakers would make different decisions if they were to get this additional information from combining these data sets?

RK: Our sense is largely no. *Faces II* and *Faces III* make compelling arguments about the prevalence of multimorbidity among Medicaid beneficiaries with disabilities and the importance of understanding high-risk subsets to target care management approaches. *Faces III* points to the value of looking at both pharmacy data and five-year data to get a more complete picture of beneficiary comorbidities, particularly related to psychiatric illness.

To address this apparent anomaly and to portray a more complete picture of the "faces of Medicaid," this revised analysis expands significantly on the initial study by adding two new data elements. First, pharmacy data were added to determine the number of individuals with behavioral health comorbidities (and other problems, e.g., cardiovascular disease) who might not be identified via claims-based diagnostic codes, but who could be identified through pharmacy utilization. In addition, a five-year set of diagnostic data was analyzed to identify how the portrait of Medicaid beneficiaries with multiple comorbidities would be altered when this information was examined across a longer period of time.[3]

A more complete portrait of Medicaid beneficiaries with multiple chronic physical and behavioral health needs emerges through these two analyses. The enhanced insight into Medicaid's most complex populations should guide states and health plans in better prioritizing high-need populations and in more effectively tailoring programs to respond to their complex needs.

A Comparative Glance of *Faces II* & *III* Results

	Diagnostic Data (one year)	Diagnostic and Pharmacy Data (one year)	Diagnostic Data[4] (five years without Rx)
DIAGNOSTIC COMPARISONS			
% of Medicaid-only disabled beneficiaries with:			
No CDPS categories (i.e., no diagnoses)	21%	16%	7%
Three or more chronic conditions	35%	45%	67%
Psychiatric illness	29%	49%	48%
Cardiovascular disease	32%	44%	48%
Three or more chronic conditions in the top 1% cost tier	83%	87%	The five-year analysis did not examine cost data.
Five or more chronic conditions in the top 1% cost tier	60%	67%	
COST COMPARISON			
Total Medicaid costs linked to beneficiaries with three or more chronic conditions	66%	75%	

Data and Methods

To determine the effect of using prescription drug information in addition to diagnostic information to identify chronic illness, authors Rick Kronick, PhD, and Todd Gilmer, PhD, of the University of California, San Diego, used the Chronic Illness and Disability Payment System (CDPS) + Rx to classify Medicaid beneficiaries. 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.[5] The new CDPS + Rx model includes 15 medication categories that identify a large number of Medicaid beneficiaries who receive pharmacotherapy, but not an ICD9 diagnosis. Four examples are cardiovascular disease, psychiatric illness (including depression, psychosis, bipolar disorder), Parkinson's/tremor, and seizure disorders. The medication categories are hierarchical within CDPS major categories. Thus, the overall number of categories remains unchanged, but the number of people identified within each major category increases. The main exhibits from the *Faces of Medicaid II* analysis (published in 2007) were replicated using this updated classification scheme. This updated analysis uses the same criteria to exclude states and beneficiaries that were used for the original study (see Appendix A).

The one-year diagnostic and pharmacy data analysis uses data from almost all Medicaid programs in the United States. CMS supplied data from the Medicaid Analytic eXtract (MAX) system for calendar years 2001 and 2002; the 2002 data are used in this report. The analytic sample includes 58% of all disabled Medicaid beneficiaries in the United States, 47% of the aged, 34% of non-disabled children, and 19% of non-disabled adults. Approximately 18.5 million beneficiaries are in the analytic sample, including 4.8 million beneficiaries with disabilities, 2.3 million aged, 8.8 million non-disabled children, and 2.6 million non-disabled adults.

To determine the effect of using multiple years of data, Dr. Kronick and colleagues created a longitudinal data file with five years of data. The data were limited to non-dual beneficiaries with disabilities receiving cash assistance who were enrolled in fee-for-service for at least six months in each calendar year from 2001 to 2005. The longitudinal data set includes approximately 1.29 million beneficiaries.

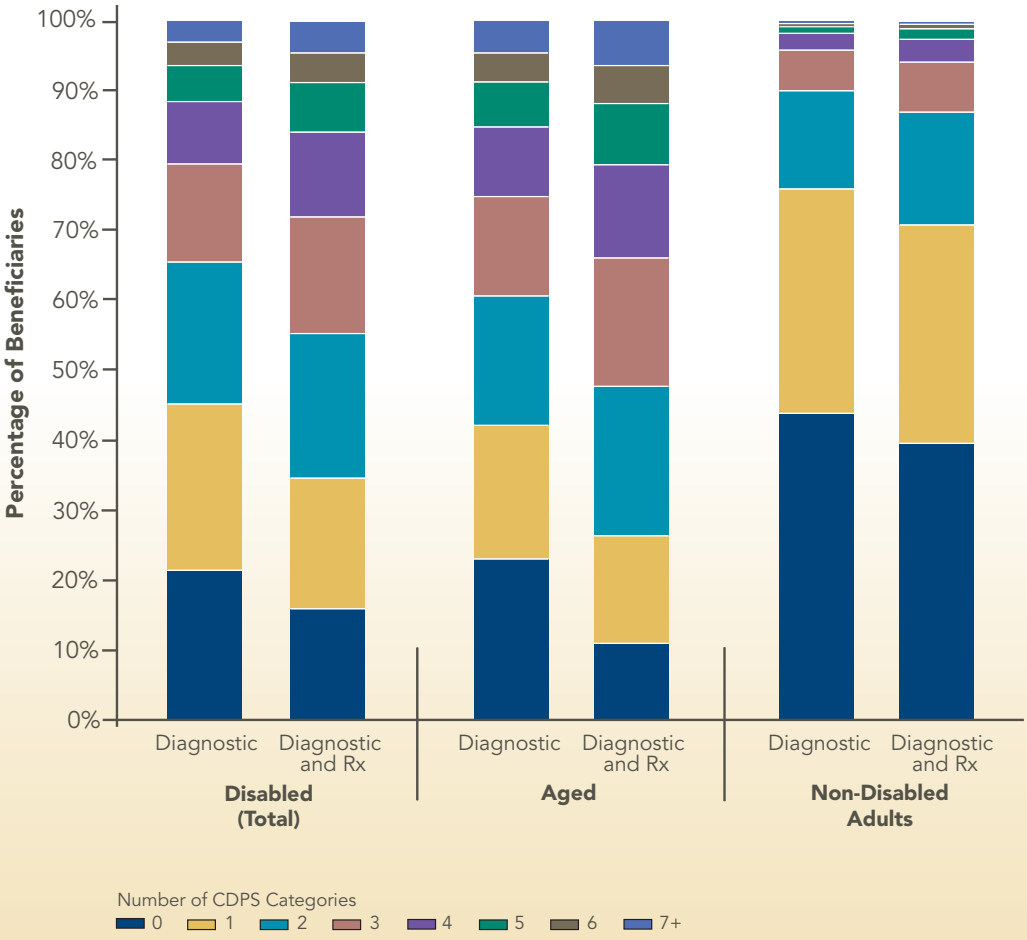
Many of the results presented herein refer to counts of the number of major CDPS categories that apply to a beneficiary. As shorthand, the text refers to the number of CDPS categories as the number of chronic conditions; however the number of major CDPS categories may both overestimate and underestimate the number of chronic conditions. Some beneficiaries may be diagnosed with more than one chronic condition within a major CDPS category; in this case, the number of CDPS categories will underestimate the number of chronic conditions. For example, a beneficiary with hypertension and atherosclerosis would be counted in the CDPS nomenclature as having one chronic condition, even though many would consider these as two separate chronic conditions. Conversely not all diagnoses included in the CDPS are commonly considered to be chronic conditions (e.g., bacterial pneumonia). As a result, the number of CDPS categories may overestimate the number of chronic conditions. On balance, the number of CDPS categories is a close approximation to the number of chronic conditions, but the two measures are not identical.

Results

Adding Pharmacy Data to Enhance Comorbidity Analysis

The addition of prescription drug data identifies significantly more beneficiaries with chronic illness than the use of diagnostic data alone. As shown in Exhibit 1, the proportion with three or more CDPS categories increases from 35% to 45% when pharmacy data are used. The proportion of beneficiaries with disabilities (Medicaid-only and dual eligibles) who have no CDPS categories is 21% with diagnostic data alone, but falls to 16% when pharmacy data are included as well. Including pharmacy data results in slightly larger changes for the aged eligibility category than for people with disabilities, and smaller changes for low-income adults without disabilities.

Exhibit 1: Distribution of Beneficiaries by Number of CDPS Categories, 2002



The addition of pharmacy data increases the proportion of Medicaid beneficiaries with disabilities diagnosed with three or more chronic conditions from 35% to 45% over diagnostic data alone.

Among beneficiaries with disabilities (Medicaid-only and dual eligibles), the addition of pharmacy data has a larger effect on the reported frequency of psychiatric illness than on other CDPS categories (Exhibit 2).[6] The frequency of psychiatric illness increases from 29% to 49% when pharmacy data are combined with diagnostic data. Pharmacy data also adds materially to the identification of cardiovascular disease among beneficiaries with disabilities (from 32% to 44%), and to the identification of central nervous system diseases (from 22% to 28%). Among the aged, the addition of pharmacy data triples the prevalence of psychiatric illness, from 10% to 36%, and cardiovascular disease increases markedly as well, from 52% to 76%. Diabetes also increases notably among the aged, from 20% to 26%.

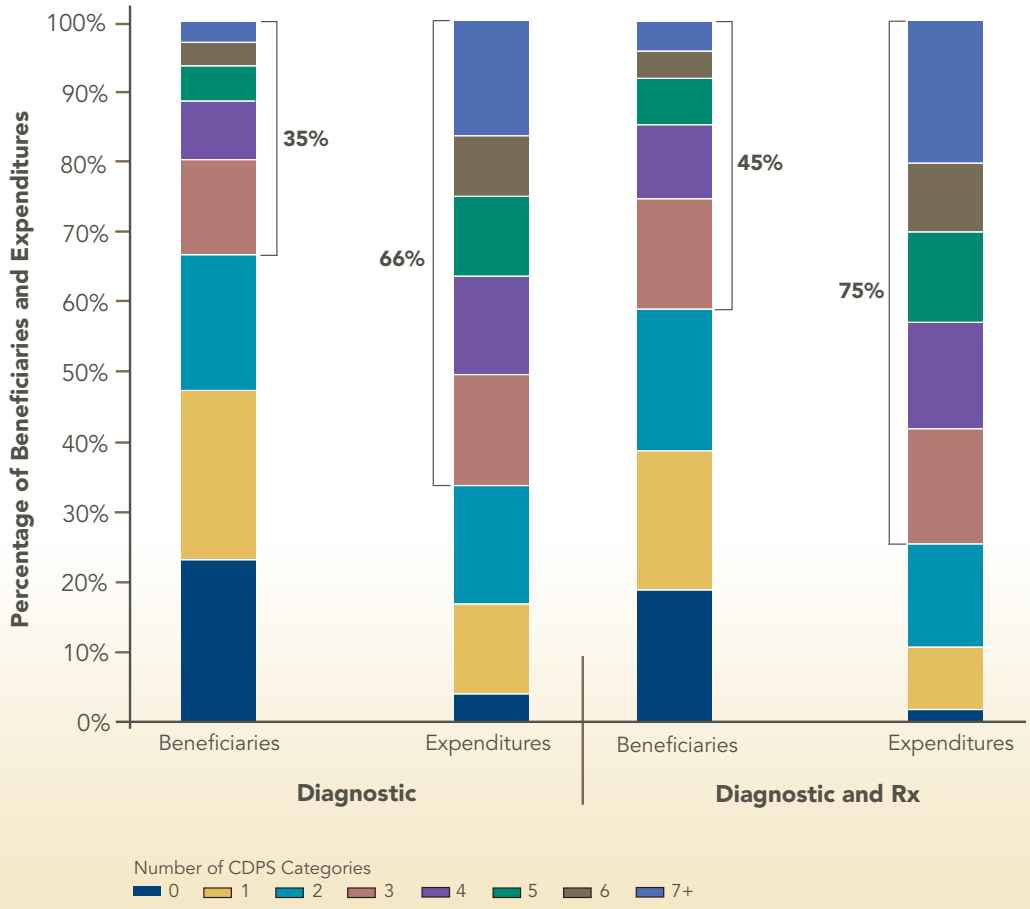
Exhibit 2: Prevalence of Major CDPS Categories, by Type of Beneficiary, 2002

	Disabled (Total)			Disabled (Medicaid-only)			Disabled (Dual Eligibles)			Aged		
CDPS Category	Diagnostic	Diagnostic and Rx	Diff.	Diagnostic	Diagnostic and Rx	Diff.	Diagnostic	Diagnostic and Rx	Diff.	Diagnostic	Diagnostic and Rx	Diff.
Cardiovascular	31.5%	44.0%	12.6%	28.4%	37.9%	9.5%	36.5%	54.1%	17.6%	51.5%	75.7%	24.3%
Psychiatric	28.8%	49.0%	20.2%	29.3%	47.0%	17.7%	28.0%	52.2%	24.2%	10.4%	35.9%	25.5%
Central Nervous System	21.9%	28.0%	6.0%	22.7%	27.7%	5.1%	20.7%	28.3%	7.6%	18.1%	21.3%	3.2%
Pulmonary	19.4%	19.6%	0.2%	19.8%	20.0%	0.2%	18.8%	19.0%	0.2%	19.6%	19.8%	0.2%
Skeletal and Connective	19.0%	19.3%	0.2%	17.6%	17.7%	0.2%	21.4%	21.7%	0.3%	24.7%	24.9%	0.2%
Gastrointestinal	15.8%	15.8%	0%	15.6%	15.6%	0%	16.0%	16.0%	0%	15.0%	15.0%	0%
Diabetes	14.7%	16.7%	2.1%	12.7%	13.8%	1.1%	18.0%	21.6%	3.6%	19.9%	25.9%	5.9%
Renal	10.0%	10.3%	0.2%	8.5%	8.7%	0.2%	12.6%	12.9%	0.3%	12.9%	13.4%	0.5%
Skin	8.5%	8.5%	0%	8.1%	8.1%	0%	9.1%	9.1%	0%	9.3%	9.3%	0%
Developmental Disability	7.0%	7.0%	0%	6.5%	6.5%	0%	7.8%	7.8%	0%	0.6%	0.6%	0%
Eye	6.7%	6.7%	0%	5.0%	5.0%	0%	9.5%	9.5%	0%	18.6%	18.6%	0%
Metabolic	6.0%	6.0%	0%	6.7%	6.7%	0%	4.8%	4.8%	0%	5.6%	5.6%	0%
Substance Abuse	5.3%	5.3%	0%	5.9%	5.9%	0%	4.3%	4.3%	0%	0.7%	0.7%	0%
Infectious Disease	4.2%	4.9%	0.7%	4.4%	4.9%	0.6%	4.0%	4.8%	0.8%	3.2%	3.8%	0.6%
Cancer	3.9%	4.9%	1.0%	3.6%	4.5%	0.9%	4.3%	5.7%	1.3%	6.9%	8.7%	1.8%
Cerebrovascular	3.7%	3.7%	0%	3.1%	3.1%	0%	4.7%	4.7%	0%	8.9%	8.9%	0%
Genital	2.6%	2.6%	0%	2.6%	2.6%	0%	2.6%	2.6%	0%	3.0%	3.0%	0%
Hematologic	2.5%	2.6%	0%	2.8%	2.8%	0%	2.2%	2.2%	0%	1.9%	1.9%	0%
Pregnancy	1.1%	1.1%	0%	1.5%	1.5%	0%	0.6%	0.6%	0%	0.1%	0.1%	0%
N	4,760,879			2,952,443			1,808,436			2,346,976		

The addition of pharmacy data increases the frequency of psychiatric illness among Medicaid beneficiaries with disabilities from 29% to 49% versus solely looking at diagnostic data. Similarly, the incidence of cardiovascular disease increases from 32% to 44%.

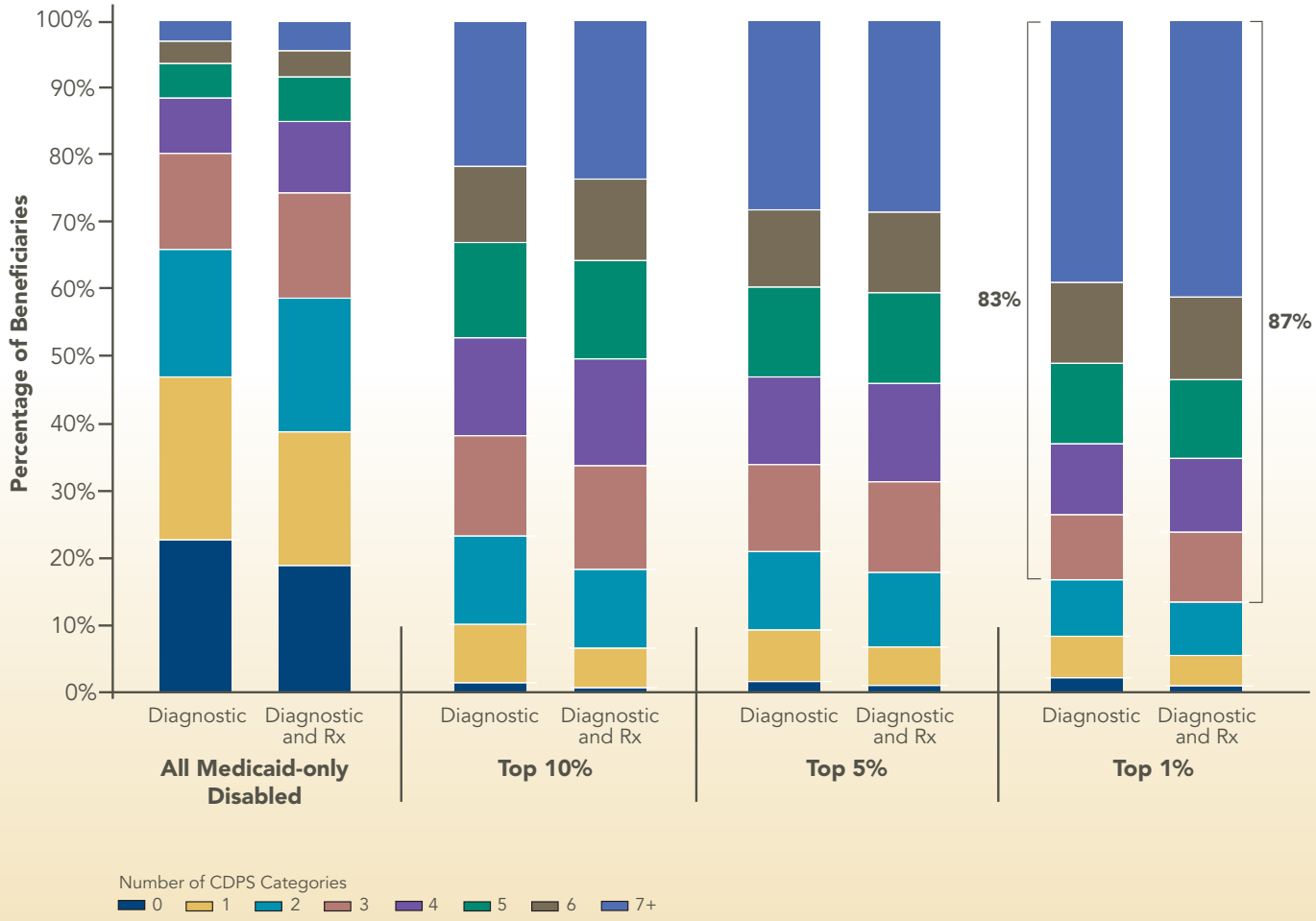
As would be expected, the addition of pharmacy data increases the proportion of dollars spent on caring for beneficiaries with multiple comorbidities (Exhibit 3), and increases the proportion of high-cost beneficiaries who have multiple comorbidities (Exhibit 4).

Exhibit 3. Distribution of Beneficiaries and Expenditures for Medicaid-only Beneficiaries with Disabilities, by Number of CDPS Categories, 2002



With the addition of pharmacy data, costs for Medicaid-only beneficiaries with three or more chronic conditions increase from 66% to 75% of total spending for beneficiaries with disabilities.

Exhibit 4. Distribution of Medicaid-only Beneficiaries with Disabilities, by Number of CDPS Categories and Expenditure Groups, 2002



Among the highest-cost beneficiaries, the majority have multiple chronic conditions, which is more pronounced with the addition of pharmacy data. Within the highest-cost 1% of beneficiaries, 87% have three or more chronic conditions, and 67% have five or more chronic conditions, up from 83% and 60%, respectively, when looking solely at diagnostic data.

Dyads and Triads among Beneficiaries with Disabilities

Understanding how conditions group into pairs (dyads) or sets (triads) of diagnoses that occur most frequently for beneficiaries with disabilities, particularly those in the highest-cost tier, can help guide the development of care management interventions. Consistent with findings in the *Faces II* analysis, there are some pairs of diagnoses that show strong associations and others that show little correlation. The addition of pharmacy data strengthens the relationships among pairs of diagnoses modestly, but for most dyads, the addition of pharmacy data has relatively little effect (Exhibit 5). For example, in examining diabetes and psychiatric illness without pharmacy data, there was virtually no relationship between these diseases — a correlation of 0.01 (Exhibit 6). This correlation resulted from the finding that 29% of beneficiaries without diabetes had a psychiatric diagnosis, while 31% of beneficiaries with diabetes had a psychiatric diagnosis — a negligible difference. When pharmacy data are included, the correlation strengthens somewhat — to 0.07; 46% of beneficiaries without diabetes are estimated to have mental illness, while among those with diabetes, 56% have either a diagnosis or pharmacy fill indicating mental illness. Thus, inclusion of pharmacy data strengthens the relationship between diabetes and psychiatric illness modestly, but the relationship remains relatively weak.

Exhibit 5. Association of Selected Diagnostic Pairs among Medicaid-only Beneficiaries with Disabilities, 2002

Diagnosis 1	Diagnosis 2	Frequency of diagnosis 2 among beneficiaries with diagnosis 1		Frequency of diagnosis 2 among beneficiaries without diagnosis 1		Correlation between diagnoses 1 and 2	
		Diagnostic	Diagnostic and Rx	Diagnostic	Diagnostic and Rx	Diagnostic	Diagnostic and Rx
Diabetes	Cardiovascular	68%	82%	23%	31%	.34	.37
Cardiovascular	Pulmonary	33%	30%	14%	14%	.21	.20
Central Nervous System	Skeletal & Connective	25%	24%	15%	16%	.11	.09
Developmental Disability	Central Nervous System	49%	54%	21%	26%	.16	.15
Central Nervous System	Pulmonary	27%	26%	18%	18%	.10	.09
Substance Abuse	Psychiatric	55%	71%	28%	46%	.14	.12
Central Nervous System	Psychiatric	32%	65%	28%	40%	.04	.22
Diabetes	Psychiatric	31%	56%	29%	46%	.01	.07
Cardiovascular	Psychiatric	32%	57%	28%	41%	.03	.16
Pulmonary	Psychiatric	34%	55%	28%	45%	.05	.08

There are relatively strong relationships between some pairs of diagnoses, e.g., cardiovascular and diabetes, but for many pairs, the relationship remains weak to moderate.

The one exception to the observation that the addition of pharmacy data does not have much effect on the strength of the relationships among dyads is for the central nervous system/ psychiatric illness dyad, and this exception is largely an artifact of the CDPS + Rx classification system. The correlation for this dyad increases substantially when pharmacy data are included — from 0.04 without pharmacy data to 0.22 with pharmacy data, with fully 65% of beneficiaries with central nervous system disorders classified to have psychiatric illness. Because anti-epileptics are so commonly used to treat mental illness, the CDPS + Rx classifies individuals using these drugs in the psychiatric illness category, accounting largely for the apparently strong relationship between CNS and psychiatric illness when pharmacy data are used to classify disease.

As noted earlier, relatively modest relationships were found between most pairings of individual conditions, including psychiatric illness and conditions such as diabetes or cardiovascular disease (Exhibits 5 and 6) where one might expect to find stronger relationships among more generalized populations. Although the individual relationships appear modest in this analysis, the relatively high frequencies of specific dyads are perhaps the more relevant findings to emphasize. That is, these data highlight that large proportions of Medicaid beneficiaries with disabilities have many specific combinations of conditions. This information can potentially be used to guide care management interventions for specific high-risk population subsets. For example, although the individual correlation between psychiatric illness and cardiovascular disease is moderate (0.16), nearly 60% of beneficiaries with cardiovascular disease were found to also have psychiatric illness — suggesting, for example, that efforts to improve the integration of physical and behavioral health care for people with heart disease should be a clinical priority.

With the addition of pharmacy data, psychiatric illness is represented in three of the top five most prevalent dyads among the highest-cost 5% of beneficiaries with disabilities. This is a notable finding because the earlier *Faces II* analysis of diagnostic data alone did not include psychiatric illness within the top five diagnostic pairs. The combined diagnostic and pharmacy data analysis identified the following five most common dyads among the highest-cost 5% of beneficiaries (Exhibit 7): psychiatric-cardiovascular (40.4%); psychiatric-central nervous system (39.8%); cardiovascular-pulmonary (34.4%); cardiovascular-central nervous system (32.9%); and psychiatric-pulmonary (28.6%). The inclusion of pharmacy data also increased the prevalence of psychiatric illness in the top five triads among the costliest 5% of beneficiaries; three of the triads include psychiatric illness compared to only one of the triads in the earlier analysis of diagnostic data alone. Within the 30 most common triads of diagnoses for the highest-cost 5% of people with disabilities (Exhibit 8), 16 include cardiovascular disease, 15 include central nervous system disorders, 13 include psychiatric illness, and 12 include pulmonary disease.

Exhibit 6. Correlations among Major CDPS Categories for Medicaid-only Beneficiaries with Disabilities, 2002

Diagnostic Data

	Psy	Car	CNS	Pul	Skc	Dia	Dev	Gas	Eye	Ren	Skn	Inf	Can	Sub	Prg	Met	Gen	Hem	Cer
Psy	1.00																		
Car	0.03	1.00																	
CNS	0.04	0.04	1.00																
Pul	0.05	0.21	0.01	1.00															
Skc	0.04	0.21	0.11	0.13	1.00														
Dia	0.01	0.34	0.01	0.10	0.11	1.00													
Dev	0.02	-0.07	0.16	-0.03	-0.02	-0.06	1.00												
Gas	0.06	0.21	0.10	0.20	0.16	0.10	-0.01	1.00											
Eye	0.00	0.15	0.02	0.05	0.08	0.17	-0.01	0.06	1.00										
Ren	0.02	0.15	0.15	0.11	0.10	0.11	0.05	0.14	0.05	1.00									
Skn	0.05	0.14	0.09	0.10	0.13	0.14	0.00	0.11	0.05	0.11	1.00								
Inf	0.02	0.09	0.06	0.13	0.04	0.04	-0.02	0.12	0.03	0.11	0.11	1.00							
Can	-0.01	0.09	0.01	0.08	0.04	0.04	-0.03	0.09	0.03	0.06	0.04	0.08	1.00						
Sub	0.14	0.08	0.03	0.10	0.04	0.01	-0.05	0.12	-0.01	0.03	0.07	0.12	0.02	1.00					
Prg	0.01	-0.03	-0.01	0.00	-0.02	-0.02	-0.02	-0.01	-0.02	0.00	0.00	0.00	-0.01	0.01	1.00				
Met	0.01	0.12	0.16	0.15	0.08	0.06	0.05	0.16	0.03	0.15	0.08	0.14	0.06	0.07	-0.01	1.00			
Gen	0.04	0.06	0.02	0.04	0.05	0.03	-0.02	0.07	0.02	0.09	0.03	0.02	0.04	0.02	0.05	0.02	1.00		
Hem	0.00	0.09	0.04	0.11	0.04	0.03	-0.01	0.12	0.02	0.09	0.07	0.14	0.12	0.08	0.01	0.13	0.02	1.00	
Cer	0.00	0.17	0.12	0.08	0.06	0.10	-0.02	0.07	0.06	0.09	0.06	0.05	0.03	0.03	-0.01	0.07	0.01	0.06	1.00
	0.03	0.12	0.07	0.10	0.08	0.07	0.00	0.10	0.04	0.09	0.08	0.07	0.04	0.05	0.00	0.08	0.03	0.06	

Average

Diagnostic and Pharmacy Data

	Psy	Car	CNS	Pul	Skc	Dia	Dev	Gas	Eye	Ren	Skn	Inf	Can	Sub	Prg	Met	Gen	Hem	Cer
Psy	1.00																		
Car	0.16	1.00																	
CNS	0.22	0.04	1.00																
Pul	0.08	0.20	0.09	1.00															
Skc	0.10	0.20	0.09	0.13	1.00														
Dia	0.07	0.37	0.00	0.10	0.10	1.00													
Dev	0.04	-0.07	0.15	-0.03	-0.02	-0.07	1.00												
Gas	0.10	0.20	0.09	0.20	0.17	0.10	-0.01	1.00											
Eye	0.03	0.15	0.02	0.05	0.08	0.16	-0.01	0.06	1.00										
Ren	0.06	0.15	0.13	0.11	0.10	0.11	0.04	0.15	0.06	1.00									
Skn	0.07	0.13	0.09	0.10	0.13	0.14	0.00	0.11	0.05	0.12	1.00								
Inf	0.03	0.09	0.05	0.15	0.05	0.05	-0.02	0.13	0.03	0.12	0.12	1.00							
Can	0.01	0.10	0.00	0.08	0.07	0.04	-0.04	0.09	0.04	0.08	0.04	0.10	1.00						
Sub	0.12	0.08	0.05	0.10	0.04	0.01	-0.05	0.12	-0.01	0.03	0.07	0.12	0.02	1.00					
Prg	0.00	-0.04	-0.02	0.00	-0.02	-0.02	-0.02	-0.01	-0.02	0.00	0.00	0.00	-0.01	0.01	1.00				
Met	0.02	0.10	0.14	0.15	0.08	0.05	0.05	0.16	0.03	0.15	0.08	0.14	0.07	0.07	-0.01	1.00			
Gen	0.04	0.06	0.02	0.04	0.05	0.03	-0.02	0.07	0.02	0.09	0.03	0.02	0.04	0.02	0.05	0.02	1.00		
Hem	0.01	0.08	0.03	0.11	0.04	0.03	-0.01	0.12	0.02	0.10	0.07	0.14	0.14	0.08	0.01	0.13	0.02	1.00	
Cer	0.04	0.15	0.11	0.08	0.06	0.10	-0.02	0.07	0.06	0.09	0.06	0.05	0.03	0.03	-0.01	0.07	0.01	0.06	1.00
	0.07	0.12	0.07	0.10	0.08	0.08	0.00	0.11	0.04	0.09	0.08	0.08	0.05	0.05	-0.01	0.08	0.03	0.06	

Average

Note: Refer to Exhibit 2 for a full listing of CDPS category titles.

Exhibit 7: Frequency of Diagnostic Dyads by Cost among Medicaid-only Beneficiaries with Disabilities, 2002, CDPS + Rx Data*

Diagnosis 1	Diagnosis 2	Frequency among all beneficiaries	Frequency among most expensive 5%
Psychiatric	Cardiovascular	24.5%	40.4%
Psychiatric	Central Nervous System	18.9%	39.8%
Cardiovascular	Pulmonary	12.5%	34.3%
Cardiovascular	Central Nervous System	13.1%	32.9%
Psychiatric	Pulmonary	11.2%	28.6%
Cardiovascular	Gastrointestinal	10.2%	27.8%
Central Nervous System	Pulmonary	7.0%	26.2%
Cardiovascular	Renal	7.1%	24.6%
Pulmonary	Gastrointestinal	5.9%	24.2%
Psychiatric	Gastrointestinal	9.5%	24.0%
Central Nervous System	Gastrointestinal	5.9%	22.3%
Cardiovascular	Diabetes	14.1%	21.9%
Psychiatric	Skeletal & Connective	11.2%	20.0%
Psychiatric	Renal	5.7%	19.6%
Central Nervous System	Renal	4.5%	19.1%
Central Nervous System	Skeletal & Connective	6.9%	19.1%
Cardiovascular	Skin	5.5%	17.7%
Psychiatric	Diabetes	9.1%	16.9%
Pulmonary	Skeletal & Connective	5.9%	16.9%
Psychiatric	Skin	5.1%	15.5%

With the addition of pharmacy data, psychiatric illness is represented in three of the top five most prevalent pairs of diseases, or dyads, among the highest-cost 5% of Medicaid-only beneficiaries with disabilities; in looking at diagnostic data alone, psychiatric illness was not among the top five pairs.

DIAGNOSTIC DATA ONLY		DIAGNOSTIC AND RX DATA	
Cardiovascular-Pulmonary	30.5%	**Psychiatric-Cardiovascular**	**40.4%**
Cardiovascular-Gastrointestinal	24.8%	**Psychiatric-Central Nervous System**	**39.8%**
Cardiovascular-Central Nervous System	24.8%	Cardiovascular-Pulmonary	34.3%
Central Nervous System-Pulmonary	23.8%	Cardiovascular-Central Nervous System	32.9%
Pulmonary-Gastrointestinal	23.8%	**Psychiatric-Pulmonary**	**28.6%**

*See Appendix B for a more complete list of diagnostic dyads among Medicaid-only beneficiaries with disabilities.

Exhibit 8: Frequency of Diagnostic Triads by Cost among Medicaid-only Beneficiaries with Disabilities, 2002, CDPS + Rx Data*

Diagnosis 1	Diagnosis 2	Diagnosis 3	Frequency among all beneficiaries	Frequency among most expensive 5%
Psychiatric	Cardiovascular	Central Nervous System	9.5%	24.4%
Psychiatric	Cardiovascular	Pulmonary	7.6%	22.5%
Cardiovascular	Central Nervous System	Pulmonary	4.6%	19.3%
Cardiovascular	Pulmonary	Gastrointestinal	4.4%	19.2%
Psychiatric	Cardiovascular	Gastrointestinal	6.3%	18.3%
Psychiatric	Central Nervous System	Pulmonary	4.9%	18.1%
Cardiovascular	Central Nervous System	Gastrointestinal	3.8%	15.9%
Psychiatric	Central Nervous System	Gastrointestinal	4.2%	15.4%
Psychiatric	Pulmonary	Gastrointestinal	3.7%	15.3%
Psychiatric	Cardiovascular	Skeletal & Connective	7.5%	15.2%
Psychiatric	Cardiovascular	Diabetes	7.6%	15.1%
Central Nervous System	Pulmonary	Gastrointestinal	2.6%	14.8%
Cardiovascular	Pulmonary	Skeletal & Connective	4.4%	13.6%
Psychiatric	Central Nervous System	Skeletal & Connective	4.8%	13.6%
Cardiovascular	Pulmonary	Diabetes	4.2%	13.3%
Cardiovascular	Central Nervous System	Skeletal & Connective	4.3%	13.3%
Psychiatric	Central Nervous System	Renal	2.9%	13.0%
Cardiovascular	Central Nervous System	Diabetes	3.9%	11.7%
Psychiatric	Pulmonary	Skeletal & Connective	3.8%	11.5%
Cardiovascular	Skeletal & Connective	Gastrointestinal	3.9%	11.5%

With the addition of pharmacy data, psychiatric illness is represented in three of the top five most prevalent disease triads among the highest-cost 5% of Medicaid-only beneficiaries with disabilities; in looking at diagnostic data alone, psychiatric illness only appeared in one of the most prevalent triads.

DIAGNOSTIC DATA ONLY

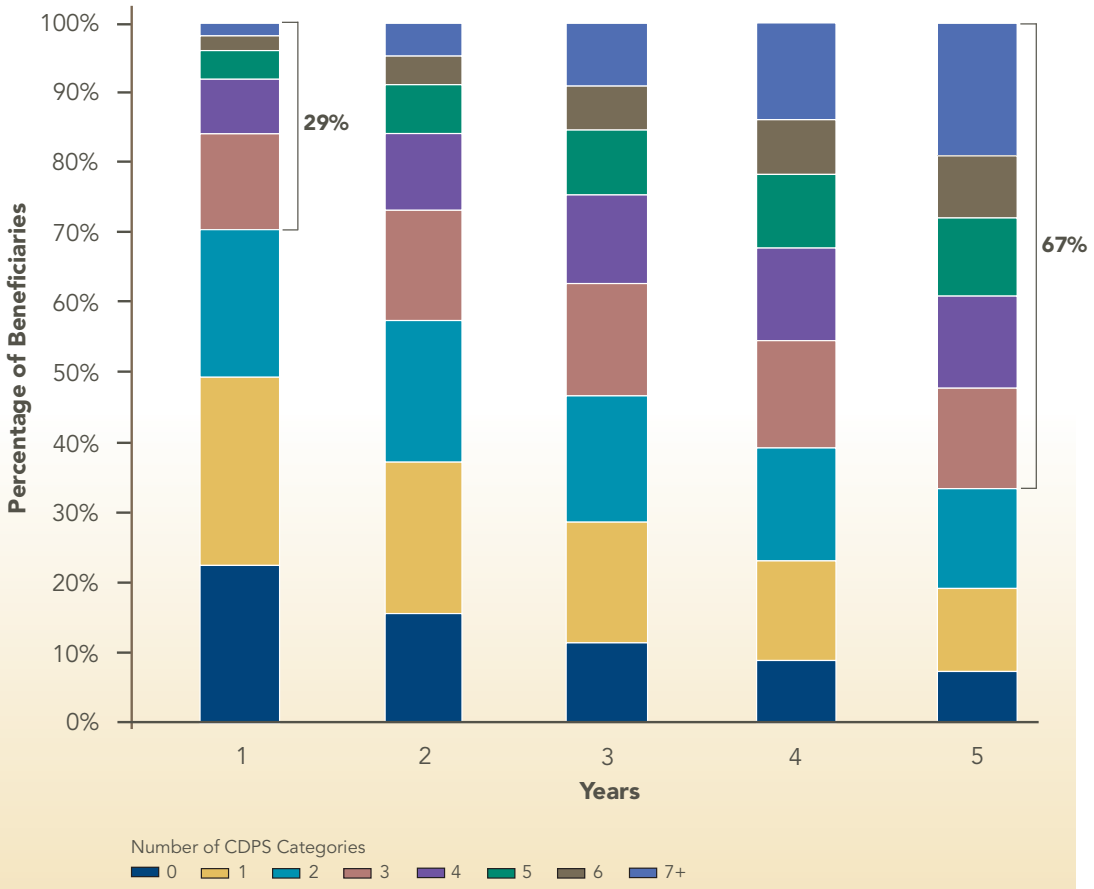
Cardiovascular-Pulmonary-Gastrointestinal.....17.5%
Cardiovascular-Central Nervous System-Pulmonary.....16.0%
Central Nervous System-Pulmonary-Gastrointestinal.....13.9%
Cardiovascular-Central Nervous System-Gastrointestinal..13.4%
Cardiovascular-Pulmonary-Psychiatric.....13.3%

DIAGNOSTIC AND RX DATA

Psychiatric-Cardiovascular-CNS 24.4%
Psychiatric-Cardiovascular-Pulmonary 22.5%
Cardiovascular-Central Nervous System-Pulmonary....19.3%
Cardiovascular-Pulmonary-Gastrointestinal.....19.2%
Psychiatric-Cardiovascular-Gastrointestinal.....18.3%

*See Appendix B for a more complete list of diagnostic triads among Medicaid-only beneficiaries with disabilities.

Exhibit 9. Medicaid-only Beneficiaries with Disabilities by Number of CDPS Categories and Number of Years of Diagnostic Data, 2001-2005



With five years of diagnostic data, two-thirds of Medicaid-only beneficiaries with disabilities (67%) have three or more chronic conditions, more than double when only one year of data are examined (29%).

Multiple Years of Diagnostic Information

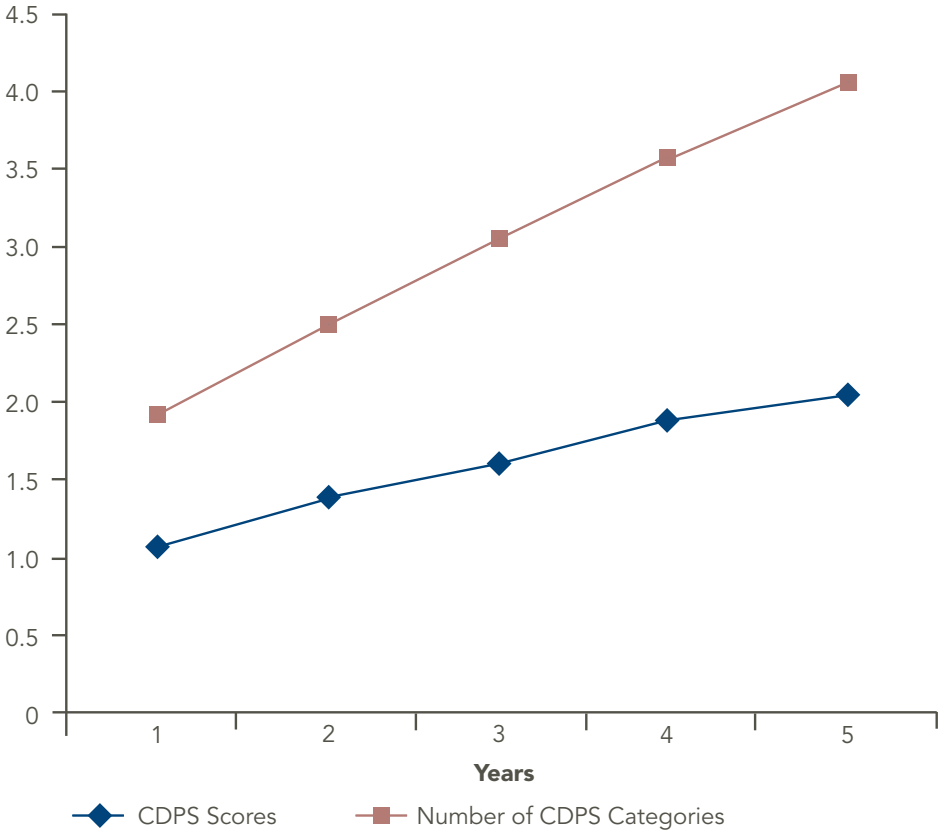
In this updated *Faces* analysis, the addition of pharmacy data to diagnostic data substantially increases the number of people who are identified with psychiatric and cardiovascular disease, and increases the percentage of people with disabilities with at least three CDPS categories. Adding four additional years of diagnostic data to the original one-year data set results in even larger increases in the proportion of beneficiaries who are identified with comorbidities.[7] Looking at five years of data may slightly overestimate the number of individuals with multiple chronic conditions by including those with acute episodic illnesses, e.g., pneumonia and other non-chronic conditions. Nonetheless, the increase in CDPS categories with additional years of data provides helpful insights, as discussed in this section.

Among the subset of Medicaid-only persons with disabilities who were eligible in each calendar year from 2001-2005, 23% did not have a CDPS diagnosis recorded in 12 months of data, 27% had a diagnosis in one CDPS category, and 50% had two or more CDPS diagnoses (Exhibit 9). When an additional 12 months of data are added, the proportion of those with no CDPS diagnoses drops to 16%, and the group of beneficiaries with only one CDPS diagnosis drops to 22%. Each additional year of data leads to further decreases in the percentage of beneficiaries with diagnoses in zero or one CDPS categories, and increases in the number of beneficiaries identified with comorbidities. When five years of data are analyzed, only 7% of beneficiaries have no CDPS diagnoses, and 12% have only one. With five years of data, fully two-thirds of beneficiaries (67%) have diagnoses in three or more CDPS categories, more than double the figure of 29% when only one year of data are used.

As shown in Exhibit 10, the number of CDPS categories increases with each year of additional data, as does the CDPS risk score.

In conducting this analysis, it was expected that both the number of CDPS categories and the CDPS risk score would increase with each year of additional data, but diminishing marginal returns were also expected. That is, it was assumed that the number of new diagnoses identified from adding the fifth year of data would be less than the number identified from adding the second year of data. In contrast to expected diminishing marginal returns, it appears that approximately the same amount of additional information is added with each year of additional data.

Exhibit 10. CDPS Scores and Categories by Number of Years of Diagnostic Data, 2001-2005



Increased numbers of CDPS diagnoses with additional years of data could result either from the identification of disease that existed in earlier years but was not recorded on a health care claim or from the incidence of new disease. For example, with the addition of five years of data, developmental disability diagnoses rose from 9% to 15%, a 65% increase (exhibit 11). Since new incidences of developmental disability are rarely, if ever, diagnosed after age 22, it seems likely that virtually all of the increase in the prevalence of developmental disabilities reflects more complete identification of pre-existing disease. The analysis was unable to fully determine what mix of these two factors accounts for the increase in CDPS categories with additional years of data.

Exhibit 11. Prevalence of CDPS Major Categories, by Number of Years of Data, 2001-2005

CDPS Category	Number of Years of Data					Ratio Year 5/Year 1
	1	2	3	4	5	
Cardiovascular	26.7%	33.1%	39.0%	43.8%	47.9%	1.79
Psychiatric	30.6%	36.5%	41.4%	45.2%	48.4%	1.58
Skeletal & Connective	15.8%	23.3%	30.0%	35.4%	40.5%	2.56
Central Nervous System	16.6%	20.9%	24.5%	27.5%	30.2%	1.82
Pulmonary	18.8%	25.7%	31.6%	35.9%	39.9%	2.12
Gastrointestinal	12.8%	18.8%	24.6%	29.4%	33.5%	2.63
Diabetes	12.3%	13.7%	16.0%	18.2%	20.2%	1.65
Skin	8.0%	13.0%	18.0%	22.6%	27.0%	3.37
Renal	6.7%	9.3%	12.3%	15.0%	17.9%	2.67
Substance Abuse	5.4%	7.7%	9.6%	11.2%	12.5%	2.33
Cancer	2.2%	3.0%	3.9%	4.8%	6.1%	2.75
Developmental Disability	8.8%	10.5%	12.1%	13.6%	14.6%	1.65
Genital	2.7%	4.6%	6.4%	7.9%	9.4%	3.47
Metabolic	5.5%	8.5%	11.4%	14.2%	16.7%	3.05
Pregnancy	1.5%	2.4%	3.1%	3.7%	4.7%	3.22
Eye	4.3%	6.3%	8.5%	10.4%	12.5%	2.88
Cerebrovascular	1.9%	2.8%	3.6%	4.5%	5.3%	2.81
Infectious Disease	5.0%	6.9%	8.9%	10.8%	13.4%	2.69
Hematologic	2.2%	3.2%	4.4%	5.7%	6.8%	3.12

Note: Table includes results on 1.286 million Medicaid-only beneficiaries with disabilities who were eligible in each year from 2001-2005.

Breaking down the complexity of patient needs by identifying clusters of chronic conditions offers a critical tool to guide Medicaid stakeholders in rethinking care management for high-need, high-cost beneficiaries.

Conclusion

Determining how to best care for Medicaid's highest-need, highest-cost beneficiaries continues to be a multi-billion dollar question for the federal and state policymakers entrusted with caring for these populations. The evidence base is beginning to grow, largely due to innovative state and health plan efforts focusing on the program's most complex and costly patients. Learning more about the specific physical and behavioral health complexities of the patient population can help Medicaid stakeholders more effectively design and prioritize care management efforts.

The previous *Faces II* analysis, based on diagnostic data from a 12-month period, confirmed that comorbidities are common among Medicaid beneficiaries with disabilities and that virtually all of the program's highest-cost beneficiaries have multiple chronic conditions. This supplemental analysis reveals that adding pharmacy data to diagnostic data results in a large increase in the estimated prevalence of psychiatric illness among people with disabilities — from 29% to 49% — as well as in the estimated prevalence of cardiovascular disease — from 32% to 44%. Similarly, with the addition of pharmacy data, the proportion of beneficiaries with disabilities diagnosed with three or more chronic conditions increases from 35% to 45%. The five-year analysis of diagnostic data revealed an even greater influence on the estimated prevalence of comorbidities. When five years of diagnostic data are used, the proportion of beneficiaries with disabilities with at least three or more diagnosed chronic conditions increases to 67%.

This analysis adds to a growing knowledge base regarding beneficiaries with multiple chronic needs and suggests further exploration of their utilization patterns and care needs. As noted earlier, CHCS is planning to explore the relationship between comorbidities and hospital readmission rates. Such investigation would potentially uncover rich opportunities for targeting care management resources. As highlighted in this analysis, the predominance of psychiatric illness among Medicaid beneficiaries with disabilities reinforces the urgent need to integrate the delivery and financing of physical and behavioral care and overcome the fragmentation that pervades our current health care delivery system. Building on this study, future CHCS efforts will delve deeper to uncover more about comorbidity patterns among people with mental illness and investigate new approaches to integrate care.

With this more in-depth picture of Medicaid's highest-need, highest-cost population, it is clear that care management strategies that recognize multimorbidity are essential. A first step in breaking down the complexity of patient needs is by examining the patterns and prevalence of chronic conditions and identifying the clusters of conditions — i.e., the dyads and triads — that are common among beneficiaries with disabilities. This will allow for better prioritization and tailoring of care management for high-risk subsets of beneficiaries and encourage the critical shift from piecemeal, condition-based care management to more holistic, patient-centered care.

Appendix A: Summary of Exclusions from Analytic Sample

Five major exclusions to the data were made in constructing the analytic sample used in this report:

1) Subset of States. Data for Arizona, Delaware, Hawaii, Maryland, Oregon, and Tennessee were not included because a very large percentage of Medicaid beneficiaries in these states are enrolled in managed care; thus, there would not have been useful information for these states. Service utilization from managed care encounter data in the MAX data system are incomplete, and expenditure data are limited to the premiums paid by Medicaid to health plans. The excluded states account for approximately 8.5% of Medicaid beneficiaries nationwide.

2) Subset of Beneficiaries. In any state in which more than 70% of the beneficiaries in a given category of assistance are enrolled in managed care, all beneficiaries in that category of assistance are excluded due to concerns that the relatively few beneficiaries in fee-for-service may not be representative of the broader group of eligibles. As a result, the following were excluded: the disabled in Michigan, New Mexico, and Pennsylvania; non-disabled adults and children in Connecticut, Minnesota, New Jersey, Pennsylvania, Rhode Island, Wisconsin, and Washington, DC; and non-disabled children in New Mexico, Michigan, and Washington State.

3) Portion of Dual Eligibles. Beneficiaries eligible for both Medicare and Medicaid ("dual eligibles") were excluded in a few states in which the diagnostic data for dual eligibles appear suspect. Among disabled beneficiaries, 23% of Medicaid-only beneficiaries did not have any diagnosis that was included in the Chronic Illness and Disability Payment System, compared to 22% with no CDPS diagnosis among dually eligible disabled. This similarity indicates that the density of diagnostic information is, on average, similar for the Medicaid-only and dual-eligibles. However, there are a handful of states in which the proportion of dual eligibles with no CDPS diagnosis is much higher than the proportion of Medicaid-only disabled with no CDPS diagnosis, and this pattern suggests that some diagnostic information on dual eligibles may be missing in those states. These states are also, for the most part, states in which the fraction of aged enrollees with no CDPS diagnosis is much higher than the national average, supporting the hypothesis that diagnostic information is incomplete for dual eligibles in these states. We exclude the dually-eligible disabled and all aged beneficiaries in Connecticut, Florida, Georgia, Michigan, North Dakota, New Hampshire, Pennsylvania, and South Dakota because the diagnostic data for these beneficiaries appear to be incomplete.

4) Short-Term Eligibles. Beneficiaries with fewer than six months of fee-for-service (FFS) eligibility in 2002 were excluded because diagnostic profiles on these beneficiaries would be less complete than the diagnostic profiles on beneficiaries with longer periods of eligibility. If a beneficiary has had a limited opportunity to see a physician, it is difficult to use physician-reported data to accurately represent that individual's diagnoses.

5) Restricted Medicaid Eligibility. Beneficiaries who were not eligible for full Medicaid benefits in July 2002 were excluded. This comprises a large number of TANF adults who were eligible for family planning services only, as well as substantial numbers of aged (and some disabled) beneficiaries who were eligible only for Medicare cost-sharing or premium assistance.

A summary of the exclusions and the number of beneficiaries affected is shown below.

Reason for Exclusion	Aged	Disabled	Non-disabled Children	Non-disabled Adults	Disabled, Medicaid-only	Disabled, Dual Eligible
Six states for which we did not request data because of very heavy managed care penetration[a]	0.071	0.080	0.079	0.103	0.080	0.080
Entire category of assistance excluded because >70% of category of assistance enrolled in managed care in 2002[b]	0.000	0.090	0.162	0.076	0.097	0.079
Eligibles excluded because diagnostic information on claims in the category of assistance in the state appear to be of poor quality[c]	0.163	0.050	0.001	0.001	0.000	0.124
Eligible in FFS for less than six months[d]	0.159	0.155	0.381	0.418	0.193	0.097
Not eligible for full Medicaid benefits in July 2002[e]	0.138	0.049	0.037	0.214	0.030	0.078
Missing age/sex info, or invalid age	0.000	0.000	0.002	0.000	0.000	0.000
Total excluded	0.531	0.424	0.662	0.812	0.401	0.459
Total included	0.469	0.576	0.338	0.188	0.599	0.541
Included N	2,346,976	4,760,879	8,835,303	2,567,027	2,952,443	1,808,436
Total beneficiaries	**5,003,000**	**8,270,000**	**26,109,000**	**13,679,000**	**4,927,000**	**3,344,000**

a) We did not request data for AZ, DE, HI, MD, OR, and TN. We use enrollment data for FY 2004 from the KFF State Health Facts web site to estimate the fraction of all US beneficiaries in each category of assistance in these six states, and assume this fraction was the same in 2002.

b) Excludes MI, NM, and PA for the disabled; CT, DC, NJ, MN, PA, RI, and WI for non-disabled adults and children; and NM, MI, and WA for non-disabled children.

c) Excludes the aged and dual-eligible disabled in CT, FL, GA, MI, ND, NH, PA, and SD; and ND for non-disabled adults and children.

d) Excludes beneficiaries with fewer than 6 months of eligibility during CY 2002, as well as beneficiaries with 6 or more months of eligibility, but fewer than 6 months in FFS.

e) Excludes beneficiaries who were not eligible at all during July 2002, as well as those who were eligible but did not have full Medicaid benefits in that month. For the aged and disabled, beneficiaries without full benefits are primarily those receiving Part B premium or Medicare cost-sharing assistance only. For non-disabled adults, beneficiaries without full benefits are primarily women eligible for family planning services only.

Appendix B: Expanded Data Sets for Exhibits 7 and 8, by CDPS Categories

Exhibit 7a. Frequency of Diagnostic Dyads among Medicaid-only Beneficiaries with Disabilities, 2002, CDPS + RX Data

Diagnosis 1	Diagnosis 2	Frequency among all beneficiaries	Frequency among most expensive 5%
Cardiovascular	Cancer	3.2%	11.1%
Cardiovascular	Cerebrovascular	3.1%	8.5%
Cardiovascular	Central Nervous System	13.1%	32.9%
Cardiovascular	Developmental Disability	2.0%	6.9%
Cardiovascular	Diabetes	14.1%	21.9%
Cardiovascular	Eye	4.9%	6.9%
Cardiovascular	Gastrointestinal	10.2%	27.8%
Cardiovascular	Pulmonary	12.5%	34.3%
Cardiovascular	Renal	7.1%	24.6%
Cardiovascular	Skin	5.5%	17.7%
Central Nervous System	Developmental Disability	3.6%	12.7%
Central Nervous System	Gastrointestinal	5.9%	22.3%
Central Nervous System	Metabolic	2.9%	14.8%
Central Nervous System	Pulmonary	7.0%	26.2%
Central Nervous System	Renal	4.5%	19.1%
Central Nervous System	Skeletal & Connective	6.9%	19.1%
Central Nervous System	Skin	3.6%	14.3%
Developmental Disability	Gastrointestinal	1.0%	4.9%
Developmental Disability	Renal	0.9%	4.0%
Psychiatric	Cardiovascular	24.5%	40.4%
Psychiatric	Central Nervous System	18.9%	39.8%
Psychiatric	Developmental Disability	4.0%	13.2%
Psychiatric	Diabetes	9.1%	16.9%
Psychiatric	Gastrointestinal	9.5%	24.0%
Psychiatric	Infectious Disease	2.7%	14.3%
Psychiatric	Metabolic	3.1%	14.6%
Psychiatric	Pulmonary	11.2%	28.6%
Psychiatric	Renal	5.7%	19.6%
Psychiatric	Skeletal & Connective	11.2%	20.0%
Psychiatric	Skin	5.1%	15.5%
Psychiatric	Substance Abuse	3.9%	10.8%
Pulmonary	Cancer	1.7%	8.8%
Pulmonary	Gastrointestinal	5.9%	24.2%
Pulmonary	Skeletal & Connective	5.9%	16.9%
Skeletal & Connective	Developmental Disability	1.1%	4.3%
Skeletal & Connective	Diabetes	4.7%	9.6%
Skeletal & Connective	Gastrointestinal	5.3%	14.5%

Exhibit 8a. Frequency of Diagnostic Triads among Medicaid-only Beneficiaries with Disabilities, 2002, CDPS + RX Data

Diagnosis 1	Diagnosis 2	Diagnosis 3	Frequency among all beneficiaries	Frequency among most expensive 5%
Cardiovascular	Central Nervous System	Developmental Disability	1.1%	4.8%
Cardiovascular	Central Nervous System	Diabetes	3.9%	11.7%
Cardiovascular	Central Nervous System	Gastrointestinal	3.8%	15.9%
Cardiovascular	Central Nervous System	Pulmonary	4.6%	19.3%
Cardiovascular	Central Nervous System	Skeletal & Connective	4.3%	13.3%
Cardiovascular	Diabetes	Eye	2.3%	3.9%
Cardiovascular	Diabetes	Gastrointestinal	3.3%	10.5%
Cardiovascular	Diabetes	Renal	2.9%	11.2%
Cardiovascular	Diabetes	Skin	2.5%	8.7%
Cardiovascular	Pulmonary	Cancer	1.3%	7.1%
Cardiovascular	Pulmonary	Diabetes	4.2%	13.3%
Cardiovascular	Pulmonary	Gastrointestinal	4.4%	19.2%
Cardiovascular	Pulmonary	Skeletal & Connective	4.4%	13.6%
Cardiovascular	Skeletal & Connective	Diabetes	4.2%	9.1%
Cardiovascular	Skeletal & Connective	Eye	1.7%	2.9%
Cardiovascular	Skeletal & Connective	Gastrointestinal	3.9%	11.5%
Cardiovascular	Skeletal & Connective	Renal	2.5%	9.5%
Cardiovascular	Skeletal & Connective	Skin	2.3%	8.8%
Central Nervous System	Developmental Disability	Eye	0.3%	1.0%
Central Nervous System	Developmental Disability	Gastrointestinal	0.7%	4.0%
Central Nervous System	Developmental Disability	Metabolic	0.4%	2.5%
Central Nervous System	Developmental Disability	Renal	0.7%	3.2%
Central Nervous System	Developmental Disability	Skin	0.4%	2.0%
Central Nervous System	Gastrointestinal	Renal	1.5%	9.8%
Central Nervous System	Pulmonary	Developmental Disability	0.7%	3.8%
Central Nervous System	Pulmonary	Gastrointestinal	2.6%	14.8%
Central Nervous System	Pulmonary	Metabolic	1.4%	10.3%
Central Nervous System	Pulmonary	Renal	1.7%	10.9%
Central Nervous System	Pulmonary	Skeletal & Connective	2.5%	11.1%
Central Nervous System	Renal	Skin	1.1%	7.1%
Central Nervous System	Skeletal & Connective	Developmental Disability	0.7%	3.4%
Central Nervous System	Skeletal & Connective	Renal	1.6%	8.0%
Psychiatric	Cardiovascular	Central Nervous System	9.5%	24.4%
Psychiatric	Cardiovascular	Developmental Disability	1.4%	5.1%
Psychiatric	Cardiovascular	Diabetes	7.6%	15.1%
Psychiatric	Cardiovascular	Gastrointestinal	6.3%	18.3%
Psychiatric	Cardiovascular	Pulmonary	7.6%	22.5%
Psychiatric	Cardiovascular	Skeletal & Connective	7.5%	15.2%
Psychiatric	Cardiovascular	Substance Abuse	2.0%	7.9%
Psychiatric	Central Nervous System	Developmental Disability	2.4%	9.3%
Psychiatric	Central Nervous System	Gastrointestinal	4.2%	15.4%
Psychiatric	Central Nervous System	Pulmonary	4.9%	18.1%
Psychiatric	Central Nervous System	Renal	2.9%	13.0%
Psychiatric	Central Nervous System	Skeletal & Connective	4.8%	13.6%
Psychiatric	Central Nervous System	Substance Abuse	1.6%	6.4%
Psychiatric	Developmental Disability	Gastrointestinal	0.6%	3.2%
Psychiatric	Developmental Disability	Renal	0.6%	2.7%
Psychiatric	Developmental Disability	Skin	0.5%	2.0%
Psychiatric	Pulmonary	Gastrointestinal	3.7%	15.3%
Psychiatric	Pulmonary	Skeletal & Connective	3.8%	11.5%
Psychiatric	Pulmonary	Substance Abuse	1.3%	6.5%
Psychiatric	Skeletal & Connective	Developmental Disability	0.7%	2.8%
Psychiatric	Skeletal & Connective	Gastrointestinal	3.5%	9.9%
Pulmonary	Skeletal & Connective	Gastrointestinal	2.3%	10.0%

Index of Exhibits

Exhibits 1-9 were updated from R. Kronick et al., *The Faces of Medicaid II: Recognizing the Care Needs of People with Multiple Chronic Conditions*, Center for Health Care Strategies, Inc. October 2007. For ease of comparison, the exhibit numbers from the prior edition are provided in parenthesis in this index.

Endnotes

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

[2] R. G. Kronick, M. Bella, T.P. Gilmer, S.A. Somers. *The Faces of Medicaid II: Recognizing the Care Needs of People with Multiple Chronic Conditions*. Center for Health Care Strategies, Inc., October 2007. The first *Faces* analysis, published by CHCS in 2000, provides a demographic portrait of Medicaid beneficiaries with chronic illnesses and disabilities and highlights the implications for enrolling the population in managed care. Download both at www.chcs.org.

[3] The five-year data set includes only diagnostic claims data, not pharmacy data.

[4] The five-year data set is limited to cash assistance beneficiaries who were eligible for the first six months in each calendar year from 2001 to 2005.

[5] 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.

[6] Note: The CDPS Psychiatric Illness category includes anxiety disorders (e.g., phobias, panic disorders), mood disorders (e.g., depression, bipolar disorder), schizophrenia, and eating disorders (e.g., anorexia). Senile psychosis is included in the Psychiatric Illness category, but dementia without psychosis is categorized within Central Nervous System (CNS) conditions.

[7] The five-year data set includes only diagnostic claims data, not pharmacy data.

***Rethinking Care Program* – Additional Resources**

Faces of Medicaid III 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 was developed by CHCS to serve as a Medicaid "learning laboratory" to design and test better approaches to care for the program'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. Through support from Kaiser Permanente, CHCS is developing tools and resources to nationally disseminate lessons from the *Rethinking Care Program*.

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**.

*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, and providers to develop innovative programs that better serve Medicaid beneficiaries with complex and high-cost health care needs.*

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