Division of TennCare

STATE OF TENNESSEE

Combined Chronic Illness and Pharmacy Payment System (CDPS+Rx) Basics

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Agenda

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What is the Chronic Illness and Disability Payment System (CDPS)?

- Diagnostic classification system developed by Richard Kronick and Todd Gilmer at UC-San Diego for Medicaid programs to make health-based capitated payments for Medicaid beneficiaries
- Separate risk models for TANF or disabled Medicaid beneficiaries, as well as adults or children
- Current uses include:
  - Premium and capitation rate setting
  - Performance assessment for value-based purchasing
  - Risk stratification for care coordination
- Used by far more state Medicaid programs than other available tools
- CDPS+Rx Model combines medical diagnoses and prescription drugs
- Software information available at: http://cdps.ucsd.edu

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How is CDPS used in PCMH and Health Link?

- How is CDPS used in **PCMH**?
  - Per-member per-month (PMPM) payments for the Patient Centered Medical Home (PCMH) program are risk adjusted using CDPS+Rx.
  - Outcome payments for high-volume PCMHs, which are based on total cost of care (TCOC), are also risk adjusted using CDPS+Rx.
  - Risk scores visible in the Care Coordination Tool (CCT) for PCMH members are derived from CDPS+Rx.
- How is CDPS used in **Health Link**?
  - Risk scores visible in the CCT for Health Link members are derived from CDPS+Rx.

- This presentation provides an overview of the basic design features and methods used to risk adjust these payments using CDPS+Rx.

Design Basics: Diagnoses Grouping

- Diagnoses and selected prescriptions combined into about 877 Stage 1 diagnosis categories which correspond to major body systems or type of diagnoses
  - Examples: Hypertension, CAD, CHF

- Stage 1 diagnosis categories further aggregated into about 140 Major Diagnosis Categories. Major Diagnosis Categories are hierarchical and risk credit is assigned only to the **most costly** category in the hierarchy.
  - Example: Cardiovascular Major Diagnosis Categories and Hierarchy
    - CARVH Cardiovascular, very high
    - CARM Cardiovascular, medium
    - CARL Cardiovascular, low
    - CAREL Cardiovascular, extra low

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Design Basics: Diagnosis Grouping

- Development of the CDPS+Rx diagnosis grouping logic was an iterative process of "lumping and splitting" diagnoses.

- Panels of physicians and coding experts provided input in determining the optimal "lumping and splitting" to produce diagnosis categories which were then statistically analyzed using claims data.

- The medical costs that are predicted by the general CDPS+Rx model include: inpatient hospital, physician, outpatient hospital, clinic, psychiatric, other practitioners, pharmacy, home health, lab & x-ray, transportation, rehabilitation physical/other therapy, hospice, private duty nursing, and durable medical equipment.

Design Basics: Diagnosis Grouping

- End goal was to produce a parsimonious set of diagnosis groupings that were:
  - internally homogeneous in terms of similar cost and also clinical meaningfulness,
  - sufficiently independent of other diagnosis groups in terms of cost and predictive contribution, and
  - robust in terms of coding practices and concerns for inducing perverse coding incentives.
- Ill-defined diagnoses that rely primarily on clinical judgement and with significant practice variation are sometimes not included for risk assessment in the final CDPS models. For Rx, where there is substantial disagreement among physicians about indications for use and concerns about overuse, drugs are not included.(e.g., Ritalin)

Design Basics: Diagnosis Grouping

- Typically, a single occurrence of a diagnosis code (either diagnosis or a prescription proxy) that maps to the same category will trigger the risk credit during that year. Additional occurrences of any of these codes will not receive additional risk credit.

- For example, Hypertension Unspecified and Hypertension map to the same Major Diagnosis Category. If a member has both diagnoses over the course of the year, it will only be factored into the risk score once.

- All costs for a population are accounted for in the model. Members without any diagnoses that map to a diagnosis category will be given a baseline age/sex risk score. This happens more frequently with children.

Design Basics: Computing Model Risk Weights

- Note: Risk is not normally distributed in any population; i.e.. Average (mean) per capita cost in a population is between the 75-85 % tile; thus, approximately 4 of 5 beneficiaries have below average risk/cost.

- CDPS+Rx provides separate models for different populations; e.g., adults versus children; disabled versus TANF; different covered services.

- Relative risk weights are internal to each model and determined from separate claims data sets for each model (adults versus children) and reflect actual diagnosis and treatment patterns in the separate populations used to develop each distinct model and its calculated weights.

- Thus, identical *diagnosis* histories will produce different risk scores between, for example, adults and children

Prospective vs. Concurrent Models

- Risk adjustment tools often offer two basic model types, based on the time frame of the costs being predicted

- The **Prospective Model** uses diagnoses from period one (year 1) to predict an individual's costs in period two (year 2)
  - TennCare MCOs use the prospective model to calculate activity payment PMPMs for all PCMHs
  - Altruista uses the prospective model to calculate risk scores in the Care Coordination Tool

- The **Concurrent Model** uses diagnoses from period one (year 1) to "predict" (explain) an individual's cost in the same period (year 1)
  - TennCare MCOs use the concurrent model to calculate risk-adjusted total cost of care for high volume PCMHs

Example: Prospective Risk Weights for Selected Diagnosis Categories

CDPS Category	Description	Children	Adults
CARVH	Cardiovascular, very high	0.53941	2.86702
CARM	Cardiovascular, medium	0.23927	0.73492
CARL	Cardiovascular, low	0.18510	0.24620
CAREL	Cardiovascular, extra low	0.06589	0.06225
PULVH	Pulmonary, very high	1.28955	4.01723
PULH	Pulmonary, high	0.67772	0.39309
PULM	Pulmonary, medium	0.39768	0.31774
PULL	Pulmonary, low	0.14708	0.13017

(Note: adult and children cost weights differ for the same category)

Computing Individual Risk Scores

An individual's risk score is the additive sum of:

- An age/sex base rate
- Risk weights for each separate diagnosis category
  - These weights are triggered by a single occurrence of any diagnosis included in the category in a year
  - Weight is only applied for *most costly* diagnosis category in a hierarchy
- Additional weight that may be included for the interaction of two diagnosis categories where significant synergies have been identified

Computing Individual Risk Scores

- The minimum individual risk score in a **prospective model** is the age/sex base rate for an individual with no diagnosis that is counted in the CDPS+Rx model.

- The minimum risk score in a **concurrent model is** the age/sex base rate which means something a bit different depending on the eligibility criteria and other characteristics of the program using risk adjustment.

- The maximum individual risk score in both models is practically limited by the range of actual cases in clinical practice and the number and type of diagnosis categories assigned rather than a mathematical limit imposed by the model.

Risk Adjustment for Behavioral Health

- There is no difference in how behavioral diagnoses are handled compared with non-behavioral diagnoses.

- Diagnosis assignment examples:
  - Schizophrenic Disorders - High
  - Bipolar Affective Disorder, Manic - Medium
  - Affective Psychoses, Major Depression - Medium Low
  - Senile and Pre-senile Organic Psychotic Conditions - Low

- Risk weights examples:
  - Psychiatric, high 0.955
  - Psychiatric, medium 0.626
  - Psychiatric, medium low 0.325
  - Psychiatric, low 0.206

Examples: Computing Individual Risk Scores

Adult (Male, 55) with diagnoses of Cardiomyopathy, Hypertension and COPD	
	.13321
	.73492
	.06225 (Not added)
Chronic Obstructive Pulmonary Disorder	.13017
	.99830
Adult (Female, 44) with diagnoses of Schizophrenia and Asthma	
Age/Gender Baseline	.06923
Schizophrenia	
Asthma	
Estimated Risk Score	

The risk weight for hypertension is not added because it is in the same major group as Cardiomyopathy

Examples: Calculating Individual Risk Scores

Child (Male, 11) with diagnoses of Asthma, Cerebral Palsy and Depression	
Age/Gender Baseline	.28867
Asthma	.14708
Cerebral Palsy	.34386
Major Depressive Disorder	.31301
Estimated Risk Score	**1.09262**

Limitations of Risk Adjustment

- No risk adjustor is perfect, but these diagnosis-based models are far more fair than not risk adjusting.
- Predictive modeling of total cost of care is always constrained by the limitations of the data available, prevalence of the condition, and inherent variation in coding and practice patterns.
- Variation across providers in coding completeness and specificity remains a limitation
- Other risk factors that may predict cost variation (e.g., social factors) are difficult to include in great part due lack of a reliable, feasibly collected, and verifiable data.

Selected Sources

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- The Revision of CDPS and the Development of a Combined Diagnostic and Pharmacy Based Risk Adjustment Model CDPS Website: http://cdps.ucsd.edu/

Questions?

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