Care Coordination Innovations Project
Chronic Illness and Disability Payment System (CDPS) Introduction

Introduction

Partner organizations undoubtedly wish to understand the health conditions and co-morbidities of their population of interest. Some partner organizations may wish to select their population of interest based on diagnoses. In order to facilitate both needs, HFS has included an array of diagnostic indicators in the Recipient table of the data set.

Diagnostic Indicators

The Chronic Illness and Disease Payment System (CDPS) is a well-known diagnosis-based risk adjustment system available in the public domain. Risk adjustment involves assigning diagnostic indicators to recipient records, then associating costs with these indicators to predict future costs. We have used CDPS version 5.3 for assigning diagnostic indicators.

CDPS classifies medical diagnoses based on 3-, 4- or 5-digit ICD-9 codes. These diagnostic categories roll up over 15,000 ICD-9 diagnoses into 20 major categories based on body systems (e.g., the renal system) or disorder type (such as diabetes). CDPS then stratifies each diagnostic category into hierarchical levels of severity (extra high, very high, high, medium, medium-low, low, very low, extra low, and super low). The level of severity denotes the level of healthcare needs of a recipient with a diagnosis within a given category. Each ICD-9 diagnostic code is associated with one diagnostic category and one level of severity within the diagnostic hierarchy.

A lowest level within the hierarchies, 'not well-defined,' encompasses diagnoses that lack clear definitions and those that are exceptionally common (such as headache). They have limited value to clinical planning and are not used for risk adjustment. A further ICD-9 category, 'excluded,' captures diagnoses that cannot be attributed to chronic conditions.

When a recipient has more than one diagnosis within a single diagnostic category, CDPS retains the indicator for the highest level and sets the lower levels to zero. This is because the lower-severity diagnosis is unlikely to add significant cost to the care of a recipient who is already receiving care at a higher severity level. This method simplifies the data model while maintaining its predictive value.

CDPS separates some specific, highly prevalent illnesses (such as diabetes) into separate categories, allowing for more specific predictions about these diseases. Finally, CDPS groups substance use disorders separately from all other psychiatric disorders, allowing for more assessment of the co-occurrence of these disorders. All three practices increase the model's epidemiological accuracy and enhance the data's usefulness for clinical planning.

Diagnostic Sources

Risk adjustment experts have long noted that diagnoses associate with certain providers and services are presumptive, rather than confirmed, and are therefore particularly unreliable. CDPS documentation is silent with respect to whether these diagnoses should be excluded. We have therefore followed Medicare guidance and limited accepted diagnosis data sources to hospital inpatient facilities, hospital outpatient facilities, and physicians [1]. Diagnoses from the following facilities are excluded: skilled nursing facilities (SNFs), hospital inpatient swing bed components, intermediate care facilities, respite care, hospice, free-standing Ambulatory Surgical Centers (ASCs), home health care, free-standing renal dialysis facilities, laboratory services, ambulances and other transportation services, radiology services, and suppliers of durable medical equipment, prosthetics, orthotics, and supplies.

Prescription Drug Data

We have chosen a CDPS method that uses national drug codes to supplement ICD-9 diagnostic codes.

CDPS identifies fifteen drug categories useful for supplementing the ICD-9 based chronic conditioner indicators, and associates a subset of the total prescription drug universe with each rule. Please see a listing of prescription drugs, ordered by diagnostic grouping, in the CDPS spreadsheet.

CDPS applies complex rules to merge diagnostic indicators with NDC-based indicators. Typically, if a condition has already been 'discovered' via diagnosis codes, the associated drug indicator is set to 0. For more information, please see the rules in the attached spreadsheet.

Specific Rules by Age and Disability Status
Rules for assigning diagnostic indicators and merging diagnostic and drug indicators vary slightly by recipient age and disability (SPD) status.

CDPS can classify recipients by age category (adult/child) and by disability status (disabled/non-disabled). We applied CDPS's non-disabled child status to all HFS recipients under age 19, even though some children are disabled and CDPS classifies 18 year olds as adults. We applied the CDPS rules for disabled adults to all Seniors and Persons with Disabilities (SPDs), even though some seniors are not classified as SPD.

These differences have minimal impact on aggregate results.

CDPS Limitations
Data users can use CDPS condition indicators to gain considerable insight into their population of interest. However, correctly interpreting CDPS requires awareness of its limitations.

CDPS flattens diagnoses into categories and severity levels to increase manageability, to ensure robustness to variances in the diagnostic reporting practices of healthcare providers, and to optimize usefulness as a cost prediction tool. However, diagnostic clustering results in a loss of precision with respect to specific diagnoses. It is not feasible to calculate the prevalence of a specific diagnosis within a category and severity level.

Please note that where diagnostic accuracy is limited, the validity of CDPS data is also impeded. CDPS controls for some inaccuracy by segregating diagnoses for which no clear definition exists (as 'not well-defined' conditions), but it cannot improve upon the specificity and sensitivity of included diagnoses.

Additionally, as a diagnosis-based tool, CDPS does not represent all Medicaid recipients. In HFS's current data set, approximately 25% of all adult recipients and 36% of all child recipients have no CDPS diagnoses. If there is no diagnosis in the past year from a credible source, there is no indicator. The completeness of diagnostic information is limited when recipients do not seek care.

Furthermore, the CDPS model does not capture all possible health needs of the included recipients, as needs are often not well correlated with diagnoses. Two recipients with similar diagnosis codes may have significantly different levels of impairment and support needs. It is probably best to consider CDPS codes in conjunction with Types of Service provided, particularly home health care, transportation, and long-term care.

What about Risk Scoring?
We note that it is possible to obtain risk weights from the CDPS website [3], which with some modification would allow the calculation of risk scores and therefore expected relative costs.

HFS has not endorsed CDPS as a risk adjustment model and HFS makes no prediction as the risk adjustment model we will use for shared savings and other Care Coordination analyses. If we were to use CDPS, we would almost certainly calculate our own risk weights using recent Illinois data, rather than relying on relatively outdated CDPS risk rates.

Questions?

If you have additional questions on CDPS methodology as applied to the data sets, please contact us at HFS.Data@Illinois.gov.

References

[1]: Center for Medicaid and Medicare Services, "Medicare Managed Care Manual," Internet: https://www.cms.gov/manuals/iom/itemdetail.asp?itemid=CMS019326.

[2]: Irvin, Carol V., and Christopher Johnson (2007), "Medicaid Populations with Chronic and Disabling Conditions: A Compilation of Data on Their Characteristics, Health Conditions, Service Use, and Medicaid Payments," Mathematica Policy Research, Inc., for U.S. Department of Health and Human Services, Center for Medicare and Medicaid Services.

[3]: --- (2011), "FAQs," University of California, San Diego: Chronic Illness and Disability Payment System, Internet: http://cdps.ucsd.edu/faqs.html.