

Using Risk Stratification to Understand Medicaid Beneficiaries with Complex Care Needs and High Costs

Risk stratification is a critical component of improving care outcomes for Medicaid Beneficiaries with Complex Care Needs and High Costs (BCNs). Conducting risk stratification enables health policy makers and clinicians to identify and predict which beneficiaries are at high risk - or likely to be at high risk - and prioritize the management of their care in support of improving health outcomes and better managing the cost of care.

This brief summarizes risk stratification activities which state Medicaid agencies may consider for identifying BCNs and high costs that would benefit from more focused care management strategies. This brief also provides examples of risk stratification tools and describes how these were used by a state Medicaid agency.

Risk Stratification Activities

Precise analytics using data from the past can help to calculate the probable future impact of certain interventions on utilization, cost of care, health status and quality of life. There are a variety of risk stratification activities that can be employed to accomplish this. Understanding the potential value of each activity is an important first step in the process of determining an approach to risk stratification and subsequent targeting. Two common risk stratification activities are described below. These activities are not mutually exclusive, and state Medicaid agencies may use one or both throughout the life cycle of a BCN state initiative.

- **Tiering:** This activity supports the establishment of risk levels and thresholds within a hierarchical structure, and the assignment of beneficiaries to distinct risk levels/categories based on multiple factors including, but not limited to case complexity and costs, level of "impactability" and levels of interventions required to mitigate risk.
- **Predictive Modeling:** This activity applies statistical techniques, learnings from controlled studies and the analysis of complex data to attribute a level of risk to a beneficiary and, perhaps of more value, infer the probability that a beneficiary's risk level might increase or decrease depending on certain factors.

One of the outputs of risk stratification is targeting, which uses the identification of risk levels or tiers to link interventions to specific populations:

- ✓ On a "macro" level, targeting occurs at the state/region/local level to channel individuals to specific BCN initiatives.
- ✓ On a "micro" level, targeting occurs at the provider level to identify beneficiaries requiring interventions of specific types and levels of intensity.

Improving Care for Medicaid Beneficiaries with Complex Care Needs and High Costs (BCNs)

In July 2014, the Centers for Medicare & Medicaid Services (CMS) launched a collaborative between the Center for Medicaid and CHIP Services and the Center for Medicare & Medicaid Innovation called the Medicaid Innovation Accelerator Program (IAP). The goals of IAP are to improve the care and health care of Medicaid beneficiaries and to reduce costs by supporting states in their ongoing payment and delivery system reforms through targeted technical support. IAP represents CMS's unique commitment to support state Medicaid agency efforts toward system-wide payment reform and delivery system innovation. The Beneficiaries with Complex Care Needs and High Costs (BCN) program area began in October 2015. IAP is also working with states on other health care delivery system reform efforts in additional program areas: reducing substance use disorders, promoting community integration via long-term services and supports, and integrating physical and mental health.

Data Used in Risk Stratification Activities

Risk stratification activities rely on processing and analysis of data from various sources. Relevant, current, accurate, and accessible data are the key to greater precision in analytics. These lead to more accurate predictions, multi-dimensional risk portraits, and better success in aligning needs with interventions. States often rely on claims and encounter data for these purposes. However, risk stratification can be improved by including data sources such as:

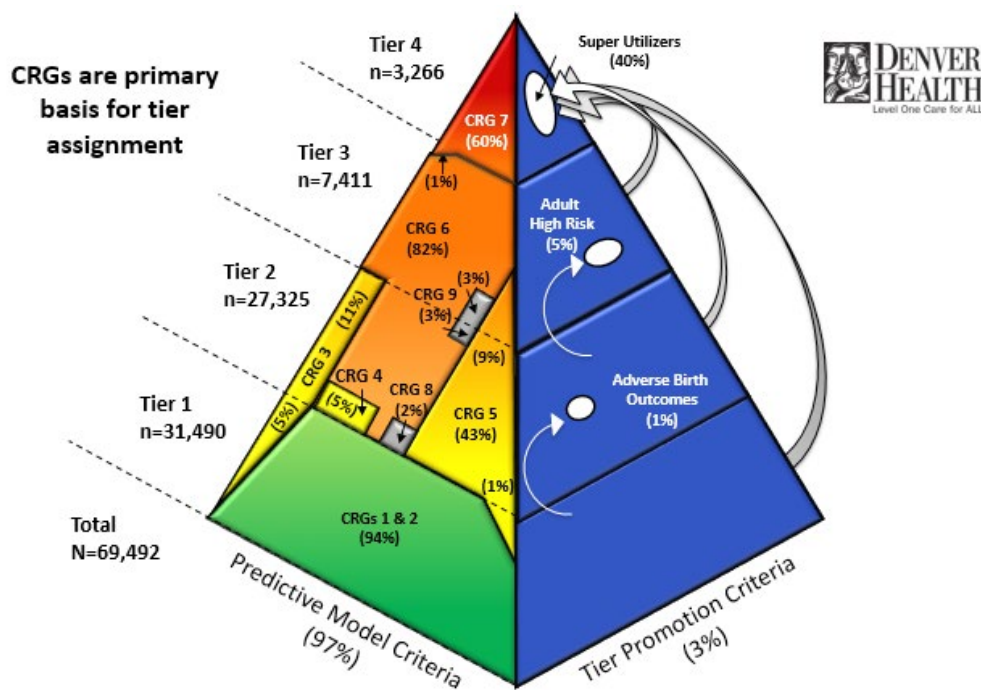
- service records from other state agencies;
- real-time utilization information from provider entities such as Admission, Discharge, and Transfer (ADT) feeds; and
- data self-reported by beneficiaries as part of screening and use of health risk assessment instruments.

States have found that including data on non-medical factors that can be collected from these sources, such as data related to housing, employment, food security and transportation, in their analyses has greatly enhanced their risk stratification efforts.

Risk Stratification Example

Many organizations include as much relevant data as possible in their risk stratification activities. These activities inform and enhance each other. As exemplified by the Risk Stratification Tier Pyramid from Denver Health¹ (Exhibit 1), each stratum tells a multi-dimensional story. This model uses Clinical Risk Groups (CRGs) to create tiers and sets the upper and lower risk tier limits for the pyramid as well as each tier. In addition, Denver Health used predictive modeling to populate those tiers. Scores are continuously calculated over time, based on new data, which causes beneficiaries to move between CRGs and tier corridors. Denver Health tracks movement within and across CRGs and tiers to try to determine which care management strategies may be effecting tier promotion and demotion, as well as which target population subsets fluctuate the most inherently. Models such as this begin to demonstrate how analytics can inform which interventions may be working, and where additional interventions or care management strategies may be needed.

EXHIBIT 1. Denver Health Risk Stratification Risk Tier Pyramid



¹ Citation: Johnson T, Estacio R, Vlasimsky T et al., "Augmenting Predictive Modeling Tools with Clinical Insights for Care Coordination Program Design and Implementation," eGEMS (Generating Evidence & Methods to improve patient outcomes). August 2015. Vol 3:1(14).

Examples of Risk Stratification Tools²

In today's advanced data analytics environment, state Medicaid agencies have many risk stratification tool options available, depending on the scope and breadth of their BCN initiatives and the internal and external resources they have available. Some states have developed their own risk stratification tools. In other cases, states have purchased risk stratification tools and/or looked to partnerships with contractors and institutions of higher learning. The choice of tools depends on the availability of data, capacity for analytics, and the approach to risk stratification that aligns best with the state's BCN initiative. Below are a few of the tools that IAP BCN program states have explored or used, which demonstrates the variety available in the market for risk stratification purposes.²

- **Chronic Illness Disability Payment System (CDPS):** This tool translates International Classification of Diseases (ICD) codes into 20 major categories of diagnoses by individual body systems or specific diagnoses, such as cardiovascular disease or diabetes. CDPS further divides these categories based on the degree of increased expenditure associated with specific diagnoses. (Tool available through University of California, San Diego, License publicly available by request)
- **CRG Classification System:** This tool classifies CRGs by grouping diagnostic codes into major diagnostic categories, and procedure codes into procedure categories. It then assigns beneficiaries into 1 of 272 mutually exclusive CRGs based on the combination of primary chronic diseases that are present within a hierarchical health status structure ranging from catastrophic to healthy. (Tool available through 3M, Proprietary)
- **Impact Pro and ERG®:** The Impact Pro tool uses clinical and episode-based predictive modeling which combines administrative claims data with clinical data. It is offered in conjunction with Symmetry Episode Risk Group (ERG®), which is a risk assessment that collects additional health data from beneficiaries. It predicts current and future health care usage for individuals and groups through risk measures using an individual episodes-of-care methodology, medical pharmacy claims, and demographic variables. (Tool available through Optum, Proprietary)
- **Adjusted Clinical Groups (ACG®) Case-Mix:** This tool measures the morbidity burden of patient populations based on disease patterns, age and gender. It relies on the diagnostic and/or pharmaceutical code information found in claims data or other electronic medical records. (Tool available through Johns Hopkins University, Proprietary)
- **DxCG:** This predictive modeling software solution generates risk scores for individual beneficiaries. Scores correlate with the cost of the underlying illness of individuals and generates group-level predictive results. (Tool available through Verscend, Proprietary)

Tailoring State Efforts

Each state will need to determine the right mix of risk stratification activities and tools that meets their needs. Risk stratification efforts evolve over time. As an example, one of the five state Medicaid agencies, which participated in the IAP sponsored BCN program, initially used its own in-house resources to stratify some BCNs based on inpatient and emergency department utilization, factoring in costs, common diagnoses, and most prominent chronic conditions as a step toward defining a target population. Subsequently this state selected a particular tool that factors cost of care into risk groups and enabled them to use these state-defined groupers to support predictive modeling algorithms, as a foundation for initial BCN targeting efforts.

²Tools referenced are provided as examples only.



CONTACT: If your state is interested in learning more about the Medicaid IAP BCN Program, email MedicaidIAP@cms.hhs.gov. Additional information on the IAP BCN program, including materials from national webinars, is available on the [Medicaid IAP BCN webpage](#).