

## Using Data to Better Serve the Most Complex Patients: Highlights from NGA's Intensive Work with Seven States

### Executive Summary

Across the country, health care systems continue to grapple with how best to serve patients with the greatest needs. These complex care patients, sometimes referred to as super-utilizers, have comorbid and often serious conditions. Within Medicaid populations and other groups, such conditions often span both physical and behavioral health and are often further complicated by social factors, such as housing instability, poverty, or limited education.

Complex care patients are difficult and costly to treat. Among Medicaid enrollees, complex care patients represent only a small proportion (5 percent) of beneficiaries but account for more than half of program costs. Finding ways to manage care effectively for this population has the potential to improve outcomes and significantly reduce state and federal health care expenditures.

Among the most critical elements in providing better care for these patients are data. Before state leaders can begin to address their super-utilizer populations, they first need to understand who those patients are, how they use the health care system, and how the state might adapt its system to meet patient needs. Advanced data systems and analyses can help answer these questions so that states can develop tailored policies and programmatic solutions to better and more efficiently treat complex care patients.

Over the past two years, the National Governors Association has worked with several states to develop

statewide initiatives for improving the management of care for super-utilizers within state Medicaid programs. The following lessons learned can help state leaders as they use data to develop effective programs and policies for complex care patients:

- **Understand the characteristics of complex populations.** Conduct data analyses to understand the breadth and scope of complex care populations within a state. Use these analyses to set a vision for serving complex patients, engage stakeholders, and build effective strategies.
- **Identify and target specific patients.** Use data analyses to determine which patients are most likely to benefit from intervention. When targeted patient populations have been determined, use data systems and outreach strategies to locate and engage individual patients.
- **Ensure effective management and evaluation.** Conduct rigorous monitoring and evaluation of the programmatic effect on outcomes and total cost of care for the population served.

### Introduction

Just 5 percent of Medicaid beneficiaries account for 54 percent of total Medicaid expenditures.<sup>1</sup> Not surprisingly, people affected by expensive conditions, such as severe trauma or organ failure, are among that 5 percent. Another subset of that population, sometimes referred to as super-utilizers, battle complex conditions for which they could receive better care at a lower cost

<sup>1</sup> Cindy Mann, "On the Road to Reform" (presentation at the Alliance for Health Reform/Kaiser Family Foundation, Washington, DC, March 3, 2011), [http://www.allhealth.org/BriefingMaterials/KFFAlliance\\_FINAL-1971.ppt](http://www.allhealth.org/BriefingMaterials/KFFAlliance_FINAL-1971.ppt) (accessed August 20, 2015).

if they were identified and provided coordinated care. Governors across the country are leading efforts to move their states' health care systems in that direction.

Since 2013, the National Governors Association's (NGA) Developing State-Level Capacity to Support Super-utilizers Policy Academy (Policy Academy) has worked with **Alaska, Colorado, Kentucky, New Mexico, Puerto Rico, West Virginia, and Wisconsin** (Policy Academy states) to develop statewide initiatives for improving care management of super-utilizers within their Medicaid programs.

## Understanding the Characteristics of Super-Utilizer Populations

The states participating in the Policy Academy began their data analyses by describing the breadth and scope of super-utilizer populations within their states. The understanding that resulted not only informed gubernatorial leadership but also was critical in developing the projects' visions, engaging stakeholders, and building effective communications and intervention strategies.

To complete the analysis, states used their Medicaid claims data and determined the look-back period and the specific claims data sets they would consider. In most cases, states analyzed data from calendar years 2012 and 2013, using the results to elicit common diagnoses and trends in the use of health care services among super-utilizer populations as well as to develop visual tools such as geospatial maps to help communicate with internal and external stakeholders about the prevalence and concentration of super-utilizer populations.

**Wisconsin's** analysis, for example, found that the top 10 percent of complex patients accounted for more than 50 percent of cost associated with the state's Medicaid Supplemental Security Income enrollees. Using the Chronic Illness and Disability Payment System (CDPS), a diagnostic classification tool used by many Medicaid programs, Wisconsin also found that

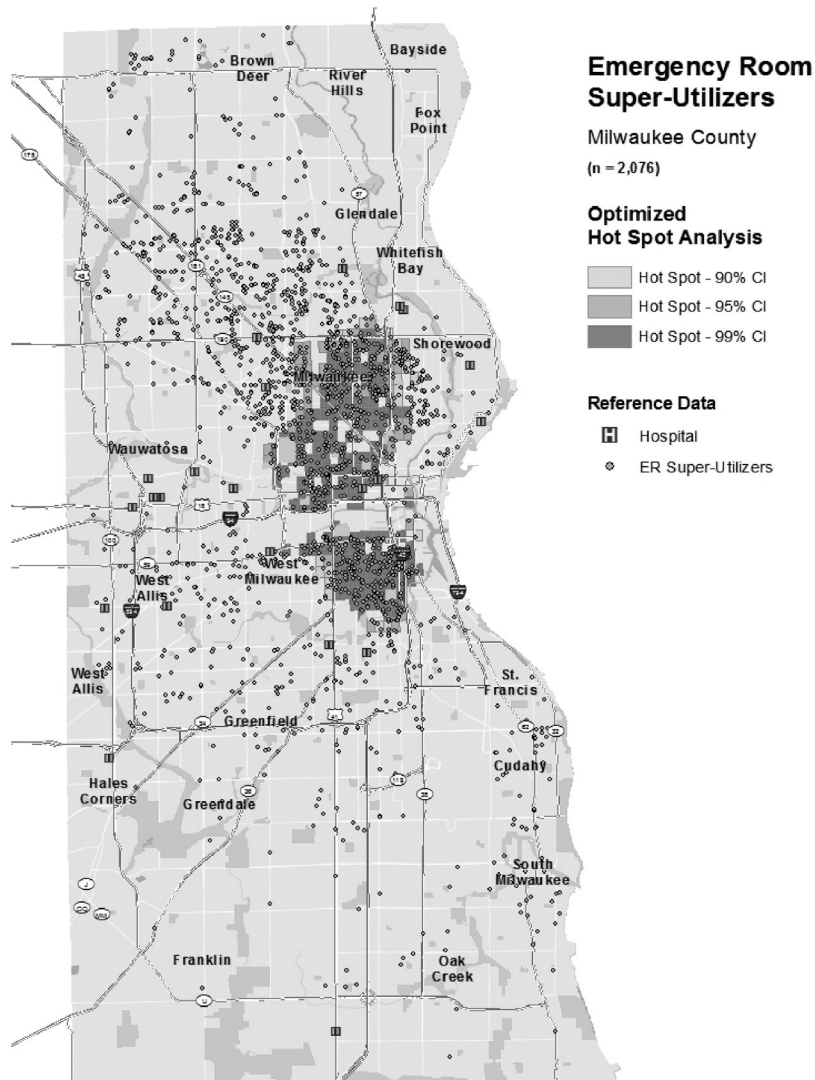
the most prevalent and comorbid CDPS conditions were related to cardiovascular illnesses, psychiatric disorders, substance abuse, and diabetes. Through geospatial mapping, the state found concentrations of high emergency room (ER) use throughout Milwaukee County.<sup>2</sup> Figure 1 (see page 3) presents a sample of geospatial ER findings in the Milwaukee region. In **Kentucky**, sample patient profiles demonstrated the intensity of ER use: One patient visited 30 different ERs in three states in the span of a year. In addition, two patients had 121 ER visits each in 2012.

After the initial analysis that identified super-utilizer populations, the Policy Academy states used their existing information systems to learn more about the target population. States applied an algorithm (a standardized step-by-step process) to identify the types of high-risk patients who might benefit from more intensive care management and coordination. In most cases, states applied their algorithm to Medicaid claims data to sort patients by ER use, inpatient admissions, primary and secondary diagnoses, total cost, and pharmacy use (see Table 1 on page 4).

States used two approaches in applying the algorithm. Some developed a set of sorting criteria for a six-month to one-year period, an approach that allowed states to isolate a consistently selected and well-defined target group. An alternative approach was to revise the algorithm more often (for example, every other month) based on query results and associated programmatic issues. That allowed states to test the criteria they applied to the data to ensure that each criterion identified the subpopulations with the greatest need and that state resources were well matched to the needs of those populations. Note that each approach affects the way in which states evaluate their super-utilizer programs. The first approach allows for a more consistent patient population but does not permit course corrections in the early stages of the intervention to address programmatic deficiencies or changes in the target population, which some experts observed could change in meaningful

<sup>2</sup> As of August 2014, geospatial mapping and data analysis were conducted only for Medicaid enrollees in the Milwaukee region.

**Figure 1. Sample of Wisconsin’s Geospatial Hot-Spotting Analysis**



ways in a matter of weeks or months.

## Identifying Specific Patients to Target and Enroll in Care Programs

After identifying core groups of super-utilizers within their Medicaid programs, states focused the analysis on identifying patients most likely to benefit from intervention. That is a particularly important step, because not all super-utilizer populations will respond to interventions. For example, in some instances, an intervention may not influence the constellation of factors underlying the super-utilizer status of patients

(so-called static super-utilizers); in other instances, patients could lose super-utilizer status regardless of intervention (for example, because they would have improved without additional assistance, sometimes referred to as regression toward the mean).<sup>3</sup>

### *Rule-In, Rule-Out Criteria*

To identify the patients whom super-utilizer interventions were most likely to help, states developed and applied rule-in, rule-out criteria. In most instances, states developed those criteria by reviewing claims data to establish shared characteristics of super-utilizers (for example, diagnoses and treatments for severe mental

<sup>3</sup> Atul Gawande, “The Hot Spotters,” *The New Yorker*, January 17, 2011, <http://www.newyorker.com/magazine/2011/01/24/the-hot-spotters> (accessed October 24, 2014).

**Table 1. Examples of State Patient Identification Criteria**

State	ER Visits	Inpatient Admissions	Other
Alaska	Five or more visits in 18 months	N/A	When patients have been flag-ged based on ER use, they are categorized into risk levels based on three criteria: <ul style="list-style-type: none"> <li>• Two or more chronic physical health conditions;</li> <li>• One chronic condition and at risk of de-veloping another; or</li> <li>• One serious and persistent mental health condition.</li> </ul> Primary and secondary conditions include dia-betes, chronic obstructive pulmonary disease, asthma, depression, and pain management.
Colorado <sup>4</sup>	Six or more visits in 12 months	N/A	Thirty or more prescription drugs in 12 months.
Kentucky <sup>5</sup>	10 or more visits in 12 months	Three or more inpatient admissions in 12 months	Regarding inpatient admissions, patients are flagged only if they have at least one ER visit plus three or more inpatient admissions in 12 months.
Puerto Rico <sup>6</sup>	Total number of visits in 12 months	Total number of admissions in 12 months	Total cost incurred in physical health services in 12 months, total cost incurred in behavioral health services in 12 months, and total number of prescription drugs in 12 months.
Wisconsin <sup>7</sup>	There or more visits in 6 months	N/A	Annual Medicaid costs of \$100,000 or more.

illness or substance abuse). In addition, states consulted with care managers from health plans and hospitals to identify key patient characteristics that correlated to deficiencies in the delivery and social support systems that could be improved through super-utilizer interventions. States also chose not to focus on some populations based on resources available at the state level (for example, by age, geography, and disease state). The rule-in, rule-out criteria were further refined and

applied at a community or provider level. Some of the most successful community-based super-utilizer programs developed rule-in, rule-out criteria by interviewing a sample of potential super-utilizers to determine underlying causes of their status. Rule-in, rule-out criteria at that level included patients’ willingness to change (typically determined by a readiness assessment), disease or conditions that could be treated in an ambulatory or community-based

<sup>4</sup> Clients identified in Colorado must meet both the ER and prescription drug criteria.

<sup>5</sup> Clients identified in Kentucky must meet either ER or inpatient admissions criteria.

<sup>6</sup> Puerto Rico’s originally designed criteria included a threshold of seven or more ER visits, but the criteria were revised to accommodate complex patients who fell outside this threshold. Puerto Rico now conducts a statistical analysis to measure the standard deviation across the five categories listed in the chart: ER visits, inpatient admissions, total cost incurred in physical health services, total cost incurred in behavioral health services, and total number of prescription drugs.

<sup>7</sup> Clients identified in Wisconsin must meet either the ER or annual Medicaid cost criteria.

setting, and the need for housing and social supports.

### ***Locate and Engage Patients***

After states identify the target population and develop rule-in, rule-out criteria, the real opportunity for change hinges on the state's ability to locate and engage individual patients. Relying solely on claims data and telephone outreach to engage patients proved to have limited value.<sup>8</sup> For example, national experts and states reported that it was difficult to locate complex patients after they returned to the community. In addition, experts reported that patients were less willing to enroll in an intervention outside the context of a specific, often exigent episode of clinical care.

Many states are designing interventions that place case workers and community health workers at the site of care—an ER or hospital inpatient unit—to efficiently identify and engage the target population. When a patient who meets established super-utilizer criteria is identified through on-site review of his or her medical record and in-person interview, the care manager enrolls that patient in the program and notifies the super-utilizer care delivery network. Another, more sophisticated option is to use admission, discharge, and transfer (ADT) feeds from health systems to identify complex patients, as **Maryland's** Chesapeake Regional Information System for Our Patients (CRISP) currently does with data from all 48 of the state's hospitals and other facilities, including labs, long-term care facilities and radiology facilities.<sup>9</sup> Such capabilities facilitate automatic notification to primary care providers and care coordinators of encounters such as hospitalizations or ER visits on a near-

real-time basis. ADT data can be analyzed to identify potential super-utilizer participants as well as monitor the services existing participants use. **New Jersey's** Camden Coalition of Healthcare Providers, NGA's partner on this project, has evolved its patient identification processes to use ADT feeds to flag complex patients and deploy care managers to patients' bedsides.<sup>10</sup>

### ***Information Systems Integration***

Policy Academy states also recognize that the integration of clinical and nonclinical information presents an opportunity to better identify super-utilizer patients and address the social challenges that plague them. After navigating the legal, technical, and practical challenges, states and provider partners are pushing ahead to develop information systems that connect clinical and nonclinical systems by, for instance, using regional and state health information exchanges (HIEs). These efforts integrate data systems across medical and human services, including mental health and substance abuse services, homelessness and housing assistance, and hospital inpatient and outpatient services.

Two leading examples of such integration explored during the Policy Academy are Hennepin Health, a **Minnesota**-based health system partnership, and **Washington's** Integrated Clinical Database (see Table 2 on page 7). Hennepin Health shares data in two forms: a single electronic health record (HR) system and an integrated data warehouse that brings together health plan claims and enrollment data, electronic health record encounters, and data indicating use of social services.<sup>11</sup> Washington's Integrated Client Database draws

<sup>8</sup> Deborah Peikes et al., "Effects of Care Coordination on Hospitalization, Quality of Care, and Health Care Expenditures among Medicare Beneficiaries: 15 Randomized Trials," *JAMA* 301 no. 6 (February 11, 2009): 603–618, <http://jama.jamanetwork.com/article.aspx?articleid=183370> (accessed August 20, 2015); Congressional Budget Office, *Lessons from Medicare's Demonstration Projects on Disease Management, Care Coordination, and Value-Based Payment*, January 18, 2012, <http://www.cbo.gov/publication/42860> (accessed October 24, 2014); and Sue E. Kim et al., "Telephone Care Management's Effectiveness in Coordinating Care for Medicaid Beneficiaries in Managed Care: A Randomized Controlled Study," *Health Services Research* 48 no. 5 (October 2013): 1730–1749, doi:10.1111/1475-6773.12060.

<sup>9</sup> CRISP.org, <http://crisphealth.org> (accessed October 24, 2014).

<sup>10</sup> Camdenhealth.org, "Care Management Program—Camden Coalition of Healthcare Providers," Camden Coalition of Healthcare Providers, <http://www.camdenhealth.org/programs/care-management-program> (accessed October 24, 2014).

<sup>11</sup> Agency for Healthcare Research and Quality, "County-Based Accountable Care Organization for Medicaid Enrollees Features Shared Risk, Electronic Data Sharing, and Various Improvement Initiatives, Leading to Lower Utilization and Costs, Policy Innovation Profile," AHRQ Health Care Innovations Exchange (Rockville, MD: Agency for Healthcare Research and Quality, May 21, 2014), <https://innovations.ahrq.gov/profiles/county-based-accountable-care-organization-medicare-enrollees-features-shared-risk> (accessed October 24, 2014).

information from more than 30 data systems across the state and includes information such as prescription drug abuse, homelessness, criminal justice encounters, employment status, and chronic health conditions.<sup>12</sup>

Like other participating states, **New Mexico** continues to work with hospital partners that are collecting and tracking data across eight domains: physical health, community support networks, substance abuse, housing, employment, utilization charges, behavioral health, and domestic violence.

**Kentucky's** HIE (KHIE) now provides clinical notifications based on Medicaid claims for use under the statewide super-utilizer ER Supportive Multidisciplinary Alternatives and Responsible Treatment initiative. The clinical notification acts as a flag to aid in the coordination of care and helps providers make information-driven decisions at the point of care. As of August 2014, 80 percent of hospitals across Kentucky were participating in KHIE.

## Ensuring Effective Program Management and Improved Outcomes

At their core, super-utilizer programs are designed to achieve improved outcomes and reduce the total cost of care. Thus, rigorous evaluation across both domains is critical in building a successful and sustainable program.

Examples of evaluation measures that states are considering include:

- Percentage reduction in inappropriate ER use;
- Percentage reduction in avoidable hospitalizations;
- Improvement in Health care Effectiveness Data and Information Set health outcomes measures;
- Completed number of comprehensive health assessments;

- Adherence to individualized care plans; and
- Initiation of substance abuse treatment.

Effective day-to-day program monitoring and management rely on consistent access to and exchange of current data. States are working toward that goal so that eventually real-time data about super-utilizer patients are available to support continuous improvement in program management. Dashboards that capture real-time information about encounters, costs, treatments, and outcomes are being developed to improve care interventions, correct course, and evaluate program performance. For example, **West Virginia** has already designed a super-utilizer dashboard that includes clinical quality measures.

## The Future of Data for Better Management of Complex Patients

Several states participating in the Policy Academy began super-utilizer programs with limited access to data and relatively modest analytics systems. Over time, as the programs improve outcomes and reduce costs, state officials say they hope to allocate resources to develop more sophisticated analytics infrastructures and further improve the reach and effectiveness of their programs. For example, states are considering investing in predictive analytics to identify the rising-risk patient population (in other words, future complex patients) as well as in more sophisticated information integration and data exchange.<sup>13</sup> Predictive analytics uses historical and real-time data to make forecasts about future events. Predictive analytics can reveal not only patient outcomes but also important relationships and patterns that exist as patients use the health system. States could analyze this information to identify future patient risk, improve clinical and nonclinical operations, and inform current and future strategic priorities. For example, predictive analytics

<sup>12</sup> Research and Data Analysis Division, *DSSH Integrated Client Database*, RDA Report (Olympia, WA: Washington State Department of Social and Health Services, May 2012), <https://www.dshs.wa.gov/sites/default/files/SESA/rda/documents/research-11-173.pdf> (accessed August 20, 2015).

<sup>13</sup> HIMSS 2012–2013 Health Information Exchange Committee, *Predictive Analytics and Health Information Exchange*, HIMSS HIE Thought Leadership Brief (Chicago, IL: Healthcare Information and Management Systems Society, May 2013), <http://files.himss.org/HIMSSorg/Content/files/Predictive%20Analytics%20and%20HIE.pdf> (accessed October 24, 2014).

**Table 2. Sample of Health Care Data Sources and Their Application in State Super-utilizer Programs**

Administrative Data Sets	Examples of Application
Medical claims Prescription pharmacy claims Behavioral health claims	<ul style="list-style-type: none"> <li>• Historical use of ER and inpatient facilities</li> <li>• Geospatial mapping of utilization</li> <li>• Display of population- and patient-level data</li> <li>• Foundation for risk stratification and establishing patient identification criteria</li> </ul>
Clinically Oriented Data Sets	Examples of Application
EHR	<ul style="list-style-type: none"> <li>• Electronic platform to collect, store, and share encounter data and patient data across provider groups</li> </ul>
ADT feeds	<ul style="list-style-type: none"> <li>• Timely assessment of patient-level data</li> <li>• Rapid cycle evaluation</li> <li>• Real-time adjudication of payments</li> </ul>

might reveal that opioid-addicted patients who have psychiatric comorbidities are among the highest risk populations for ER use, allowing a state to develop a targeted program or policy to prevent avoidable ER use for this population.

**Colorado's** HIE is developing predictive analytics capabilities to provide greater understanding of use patterns and allow risk stratification for medical providers in the western Colorado network. The tools are designed

to improve care coordination for patients who have chronic diseases and for other complex care patients.

Importantly, many states also are considering developing risk-based partnerships with provider organizations to align economic incentives for the treatment of super-utilizer populations. Rigorous, data-informed evaluation will play a critical role in establishing the parameters of such contracts, including responsibility for risk-based payments.

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