

Practical guidance for assessing equity and the impact of social determinants on health outcomes

In 2021, the Centers for Medicare & Medicaid Services (CMS) issued a [new roadmap](#) urging states to address equity and social determinants of health (SDoH) to improve outcomes. [Many state Medicaid agencies](#) accelerated the strategic planning process to both address outcomes and focus upon improving equity. The quality and equity strategies were closely linked with the goal of identifying and addressing disparities as the primary driver to improve quality.

At the recent gathering of Medicaid directors at the National Association of Medicaid Directors (NAMMD) in Washington, D.C., it was recognized that innovation requires program iterations. So, as a Medicaid senior leader, where do you begin to outline a data-driven approach to support these iterations?

I interviewed Yichen Zhang, PhD, lead research economist at 3M Health Information Systems. She has led large quantitative analyses on Center for Medicare & Medicaid Innovation (CMMI) projects and shares her perspective on these complex issues. Dr. Zhang also explains the principles of research design using claims and encounter data augmented with social determinants variables that may be available to many state Medicaid organizations.

How do you design your study to support innovations such as a 1115 waiver program to determine areas of greatest need within your population and assess outcomes? Furthermore, how do we establish a foundation built on data that is flexible to accommodate a changing focus as multiple iterations ensue?

Dr. Zhang: While there is abundant [literature](#) on the effect that demographic and SDoH have on health outcomes, most studies are based on population-level social determinants data such as the [social vulnerability index](#). We believe that a design constructed of person-level data is key. This avoids the issue of homogeneity common with an area aggregation index that applies an attribute to everyone in a given zip code for instance. A person-level analysis provides more precise findings conducive to future flexibility and actionability. For example, leveraging 3M [methodologies](#), the 3M HIS clinical and economic research group is supporting an SDoH project with a state Medicaid agency in close partnership with sister public health, housing, justice and economic development agencies. This project examines disparities in person-centered health care outcomes while quantifying and layering in the extent to which the interaction of SDoH, demographics and health care services is associated with their variation. This will give us a baseline or foundational data that can further be sliced and diced as research indicates priority areas of focus, while solutions and policy iterate.

What data can be used when connecting SDoH and health outcomes?

Dr. Zhang: 3M uses standard claims and encounter data to quantify potentially preventable health outcomes. Also, it is important to determine your best and most credible or complete sources of social determinants and public health outcomes data. SDoH data may include readily available demographic data available for enrollees, corrections data, housing data to

determine homelessness and public health data - all may be quite useful to perform an enhanced analysis of equity and outcomes, including maternal and child health outcomes.

How do you accomplish an analysis of such a large amount of health outcomes data based upon various equity or SDoH factors?

Dr. Zhang: First, 3M quantifies health care access, utilization and cost outcomes using 3M's clinically sophisticated potentially preventable events (PPEs) indicators which requires inputting claims and encounters into our algorithms and housing the output. PPEs include **3M™ Potentially Preventable Admissions (PPAs)**, **3M™ Potentially Preventable Readmissions (PPRs)**, potentially preventable returns to the emergency department after an inpatient discharge (PPR-EDs), **3M™ Potentially Preventable Emergency Department Visits (PPVs)**, **3M™ Potentially Preventable Services (PPSs)**, and **3M™ Potentially Preventable Complications (PPCs)**. We will add other health outcomes to the dataset, such as birth outcomes of interest, including complex labor, fetal mortality, maternal mortality, gestational age, birthweight, Cesarean section, neonatal intensive care admission, characteristics of labor and delivery and congenital anomalies. Twelve-month postpartum outcomes of interest include maternal depression, infant mortality, maternal mortality, inter-birth spacing and contraception use. Our goal is to create a broad list of health outcomes.

These health outcomes are then used in a regression analysis with various social determinants to identify correlation between variables. Essentially, the regression analysis performs the work of data mining a complex multivariate dataset to identify significant findings using a more efficient work effort. This is in contrast to a hypothesis-test format that only allows investigation of one hypothesized relationship at a time. For example, what is the hospital potentially preventable admission rate for diabetics that have been in prison within a three-year period?

To identify equity priority issues, the regression analysis will identify the correlation between types and severity of negative health outcomes experienced, utilization of health care services and cost of care variation by SDoH factors such as correction system stays and/or homeless status for various cohorts. The cohorts will be a combination of clinical cohorts as identified by **3M™ Clinical Risk Groups (CRGs)** combined with various social determinants. Of course, where there is variation, there is opportunity! That is what economists and health researchers do. In other words, you will look for disparities between cohorts (e.g., those maternity patients with a history of incarceration versus those with none) as well as within cohorts (e.g., previously incarcerated maternity patients of various racial groups).

How do we make sure that we are comparing apples to apples?

Dr. Zhang: A key requirement for such studies is to control for clinical risk which 3M HIS does using 3M CRGs in a clinical model designed to identify patient cohorts. Essentially, variation is risk adjusted at the person level by using the 3M CRG software. Also noteworthy, 3M CRGs can accept a variety of functional health status data to further describe your most fragile cohorts.

How much data do you recommend using?

Dr. Zhang: Well, there is no limit, but it is also not more is better. We choose reasonable input variables and the appropriate cohort, then assess your time constraints as you will need to compile all elements for the regression analysis. We suggest identifying the data sources that provoke the most interest with select data elements from each source. 3M PPEs serve to quantify health outcomes more quickly than if you had to devise a homegrown measurement. I suggest using three to four years of baseline data which provides a robust foundation for trending and will give you perspective of health outcomes perhaps impacted by COVID-19.

Are there any cautions for those wanting a baseline database to establish a foundation for innovation such as a 1115 waiver which will require annual outcomes assessment?

Dr. Zhang: Take the time to establish robust foundational data. Defining health outcomes through standardized units provides levers to both track changes over time and support interventions, whether changes to eligibility, benefits and reimbursement policy design. Our described approach goes beyond the usual limitations of population-level SDoH data, which can mask variation within a geographic area. Because we are using detailed beneficiary-level data and outcomes, we increase the specificity of the results to reveal important underlying patterns that provides flexibility of analysis for the future without having to restructure the entire analysis. For example, quantifiable results of the impact of incarceration on health outcomes for specific populations will highlight where the greatest disparities exist and what the greatest opportunities for improvement are, and the ability to measure results going forward. Results are measured to identify opportunities to promote better outcomes, to identify gaps and areas of focus for future program and policy improvement initiatives and help those with the greatest disadvantage.

How can 3M HIS tools help us with an equity assessment?

For questions about how 3M can assist with a quantitative SDoH analysis identifying equity priorities using the 3M PPEs and 3M CRGs, please [contact us](#).

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