

WHITE PAPER

Identify Socio-demographic Challenges to Manage Patient Risk

Understanding Sources of Risk to Deliver Better Care

Michael E. Taylor

Alicia M. Gomez, MSW, MBA

Ryan J. Bengtson, MHSA



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As healthcare transitions to value-based reimbursement, providers must become experts at identifying and managing patient risk across the continuum of care. Unmanaged patient risk leads to lower quality, lower reimbursement, and higher overall healthcare costs. In this environment the challenge for healthcare providers is to not only identify patients at risk, but to also understand those risks in dimensions that allow for optimal design and delivery of personalized care.

SOCIO-DEMOGRAPHIC INSIGHT

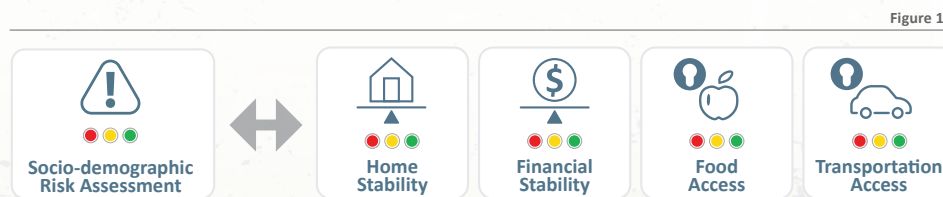
There is considerable and growing evidence that socio-demographic and environmental factors have a significant impact on an individual's health. Leading organizations like the American Academy of Nursing, Centers for Medicare and Medicaid Services, and Agency for Healthcare Research and Quality all note the importance of elements outside of the exam room, factors at home and in the neighborhoods of patients. Most patient risk analytics focus on clinical and utilization metrics. While this information is powerful and core to treatment, it misses insight to the patient's context outside of a healthcare facility.

Consider a patient living alone with diabetes in a neighborhood without any nearby groceries and without a car. Limited access to healthy food options will meaningfully impact their ability to manage their condition over time. Research has shown that factors such as transportation, financial capability, housing situation and food access influence an individual's health. Within a group of patients with similar clinical risk profiles, differences in these elements will impact their ability to get and stay healthy.

Connance's Whole Patient Insight™ (WPI™) technology confirms the power of this data (see sidebar on Predictive Power). Connance WPI is a predictive analytic solution that evaluates an individual's specific social, economic, and environmental stresses in the context of their health needs, and requires only the patient name and address plus their top-line clinical condition. It is specifically designed to deliver both an aggregated risk measure as well as the underlying stressor measures appropriate for that care context such as a standard hospital discharge, a more complex bundle program, or an ambulatory wellness visit.

UNDERLYING RISK DRIVERS—STRESSORS

The socio-demographic lens in a system like Connance WPI truly stands out because it offers insight into the specific types of programs and resources beyond clinical services that patients need to thrive. The insight is like a roadmap for care managers and care plan design.



In the Connance WPI system, the models deliver not only overall risk measures but also the underlying stressors that create risk.

In a data study with a large west coast acute care network, Connance WPI analyzed two years of discharges, more than 15,000 patients, in Medicare penalty categories to predict readmissions. Connance's system had a predictive accuracy of 87% for 30-day readmissions, as measured by area under the curve. This top-line insight certainly shines a spotlight on high-risk patients; however, the underlying stress analysis provided even more value.

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Among the population with moderate to high readmission risk (4,603 patients, 30% of the overall population), the model identified 103 patients (2% of the at-risk group) that were at risk due only to clinical stress. The remaining 98% had elevated stress in at least one or more of the socio-demographic stressor categories, with 23% of the patients having high risk in all four categories. This is further validation for the impact socio-demographics have on readmissions and other measures of health compared to clinical context alone (See Figure 2).

Consider the insight gained from the socio-demographic analysis within a single diagnosis, pneumonia. Of the 598 patients discharged following a case of pneumonia, 76 (12.7%) were identified as moderate or high risk for readmission based on their socio-demographic factors. In effect, socio-demographic insight narrowed the risk pool by nearly 90% and provided insight to the post-discharge care imperatives (See Table 1).

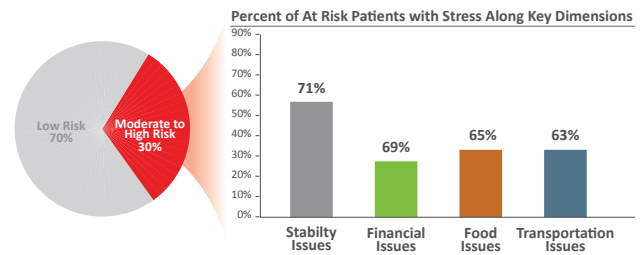
Additional results of interest within the pneumonia population:

- Among the 522 patients with low readmission risk, 71% had only zero or one underlying high-stress socio-demographic factor
- Of the 20% of the population with the highest readmission risk, the patients averaged 2.75 moderate and high stress socio-demographic factors each
- 38% of the overall population had only one high-stress socio-demographic factor, and among this population 13% were considered to have moderate-to-high readmission risk
- Only 5% of the overall population had low readmission risk and low-stress in all socio-demographic factors

ACTIONABILITY

Stressor-level insight is like having a social work assessment prior to meeting the patient. Nurse care coordinators, social workers and patient follow-up teams can organize ahead of patient interactions and better match their interventions to the patient context. Ride sharing for those recognized to lack transportation; food support to those missing easy access to markets; and home visits for those recognized with multiple challenges. One example use case could be applying stressor-level insight to our high-risk pneumonia population to create a patient outreach worklist that identifies likely candidates for a discount prescription home delivery program (See Table 2).

Figure 2



STRESSOR CATEGORY	# AT-RISK PNEUMONIA PATIENTS IMPACTED
Housing Stability	68 (89%)
Food Access	58 (76%)
Financial	51 (67%)
Transportation	40 (53%)
All Socio-demographic Categories	24 (32%)
Clinical Stress Only	0 (0%)

Table 1

7 WEST PATIENT CENSUS: PNEUMONIA PATIENTS WITH HIGH FINANCIAL AND TRANSPORTATION STRESS					
First Name	Last Name	Financial Stress	Transport Stress	DRG	Primary Insurance
George	Smith	High	High	193	Self
Elouise	Johnson	High	High	195	Medicaid
Edward	Stevens	High	High	193	Medicare
Arthur	Jones	High	High	194	Aetna
Yvonne	Rogers	High	High	193	Self
Vincent	Williams	High	High	195	Cigna

Table 2

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At the individual patient level, socio-demographic systems like Connance WPI which deliver both overall and component insight enable step-function productivity increases across patient support processes:

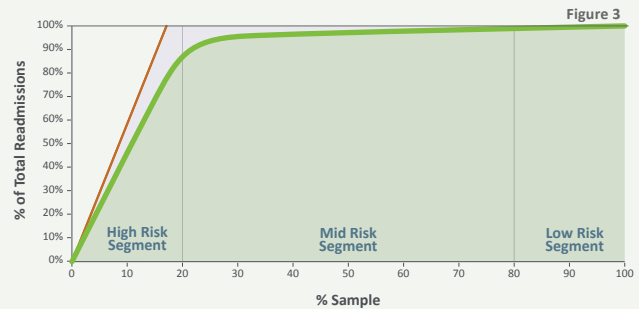
- **Discharge planning:** Sort worklists by complexity or need; design meeting agenda and even attendees around specific issues.
- **Post-discharge follow-up:** Prioritize patient follow-up by risk; target more complex situations for home visits or for phone engagement by more skilled resources.
- **Care plan design:** Target care plans around known issues so that patients and families more quickly access critical resources; improve uptake through focus.
- **PCP support:** Flag specific patients or households for proactive check-ins by predictively understanding a patient's daily socio-demographic risks.

At a population level, a system like Connance WPI affords similar unique insight. Population health systems that require claims data to analyze risk are blind to new members. Waiting for something to happen is a high-cost solution. According to The Advisory Board Company, “nearly 20% of medium-risk patients each year escalate and become high risk patients”. By understanding the social and environmental context of the patients, providers can better prevent patients transitioning into the high risk category. Population level applications include:

- **Population need mapping:** Identify needed programs given the mix of social challenges.
- **Program development & community partnerships:** Understand gaps and build out new plans.
- **Prioritized new member engagement:** Identify patients in high risk situations and prioritize them for PCP check-up and health meetings.

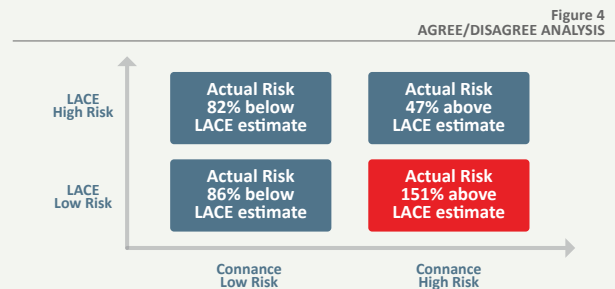
PREDICTIVE POWER

In multiple predictive studies, Connance WPI has demonstrated exceptional ability to identify patients at risk, outperforming LACE and other clinically focused systems. In readmission predictions, which is one common application case, Connance's WPI has delivered an area under the curve (AUC) measure ranging from 87% to as high as 93%. The AUC is the ratio of the green area to 'perfect' which is the sum of the green and grey (see Figure 3).



In a side-by-side comparative readmission prediction study with LACE, a commonly used risk analytic based on clinical and utilization data, Connance WPI demonstrated the relative power of the socio-demographic lens (See Figure 4).

- WPI AUC was 30% higher than LACE.
- When LACE suggested low risk and WPI suggested high, the actual risk was 151% higher than LACE predicted. In effect, LACE significantly missed high risk patients.
- When LACE suggested high risk and WPI suggested low, the actual risk was 82% lower than LACE predicted. In effect, LACE led to resource investment where the risk was in fact low.



Source: Connance comparative analysis done for provider in Southeast U.S. using LACE to manage readmission workflow

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SUMMARY

As healthcare organizations and clinicians continue to fine-tune efforts to improve care delivery, the social context of patient populations must be proactively incorporated into daily practice. By understanding the individual socio-economic, environmental, and behavioral stressors, providers can develop targeted, personalized care plans that will promote patient engagement while more efficiently utilizing limited financial and human resources.

At the aggregate or community level, this insight also allows the organization to better understand the prevalence of these various stressors that are negatively impacting their patient population. Providers can then strategically develop comprehensive and effective population health programs that meet the needs of those who provide care and those who need to receive care.

The Authors:

Michael E. Taylor
Manager, Population Health
Connance

Alicia M. Gomez, MSW, MBA
Director, Population Health
Connance

Ryan J. Bengtson, MHSA
VP, Population Health
Connance

About Connance

Connance is the industry's premier source of predictive analytic technology solutions that enable healthcare providers to optimize financial and clinical workflows for sustained performance improvement.