

Caring for the Whole Patient

Predictive Analytics Technology, Socio-Demographic Insights, and Improved Patient Outcomes

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Socio-demographic data, not normally present in the electronic health record, and not routinely found in the hands of clinicians, can dramatically improve patient outcomes. The admission diagnosis, clinical condition, and laboratory results of a patient represent a fraction of the information needed to develop a successful treatment plan. Key elements also reside within the social, economic, and behavioral context of a person's life. Examples include attributes of their neighborhood and home environment, insight into their work situation, education level, language, and even hobbies and interests. When a whole-patient view is available to providers it enables more efficient targeting of health maintenance interventions to optimize discharge planning, reduce preventable readmissions, and improve population health.

According to the CDC, social and economic factors drive upwards of 40% of consumer health, and behavioral elements account for another 30%. In a perfect world, providers would have unlimited time to spend with each patient, and no clinical, social, economic, or behavioral element would escape their grasp. Every critical detail would be captured and meticulously entered into the patient's medical record, and at the end of a lengthy patient encounter, whole patient insight would be achieved. Every physician, nurse, and home care resource would be aware of this information and incorporate it into their patient communications and suggested care plans for maximum effectiveness.

The realities of healthcare delivery today, however, preclude providers from gathering and synthesizing a comprehensive patient view. Productivity expectations lead to a clinician's day being composed of a long list of very short patient interactions. Electronic Health Records excel at capturing clinical insights and integrating them into care pathways, but they are short on socio-demographic and behavioral elements. Even if these barriers to real socio-demographic insight were overcome, there would be uneven processing and use of the data.

Figure 1:

Socio-demographic insights can dramatically improve both quality of care and patient outcomes. When a whole patient view is available to providers it enables more efficient targeting of health maintenance interventions to optimize discharge planning, reduce readmissions and promote wellness.

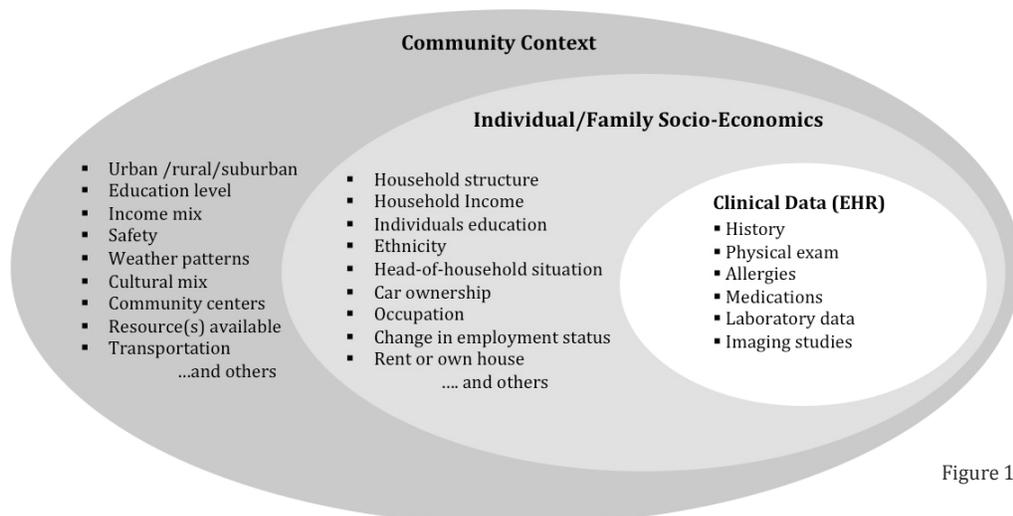


Figure 1

The structural challenges of time, information capture, and data processing are not likely to change going forward. Actually, with expanded clinical networks and more specialized health-care resources, as well as increasing risk-based reimbursement, the situation is likely to get even more complicated. This leads to a series of critical challenges going forward. How do we augment the data currently available to the growing network of intertwined providers in a way that presents a more complete and common view for all? How do we help this extensive provider community live within their ever-increasing time constraints? Resources and programs are available in our medical neighborhoods, but they have finite capacity. Tradeoffs occur and questions often arise over resource allocation in this setting. How do we prioritize patients for various programs and systematically and rapidly gather feedback on the impact of these various programs, relative to clinical and socio-demographic challenges for better targeting over time?

Predictive analytic technologies can gather the missing socio-demographic data, and process the information to deliver a composite risk measure, and the limited set of underlying factors which comprise it. These socio-demographic measures can augment the robust clinical insights and protocols to optimize care management programs for the whole-patient. All of this can be done in the background so that the clinical teams are presented only the aggregate risk measures, the specific factors creating challenges, and specific recommended workflow implications. The technology does not lead to data inundation, but rather insight and integration across clinical teams over time.

Connance has built one such socio-demographic predictive model capable of stratifying a patient population. Within a national sample of more than 200,000 Medicare patients in CMS penalty categories, the Connance model identified the 20% of the sample that produced more than 80% of readmissions that occurred within 30-days of discharge. The last 30% of the predicted curve represented less than 5% of subsequent readmissions. Area under the curve, a measure of predictive accuracy, was greater than 93%.

Figure 2:
 Within a national sample of more than 200,000 Medicare patients in CMS penalty categories, the Connance model identified the 20% of the sample that produced more than 80% of readmissions that occurred within 30-days of discharge.

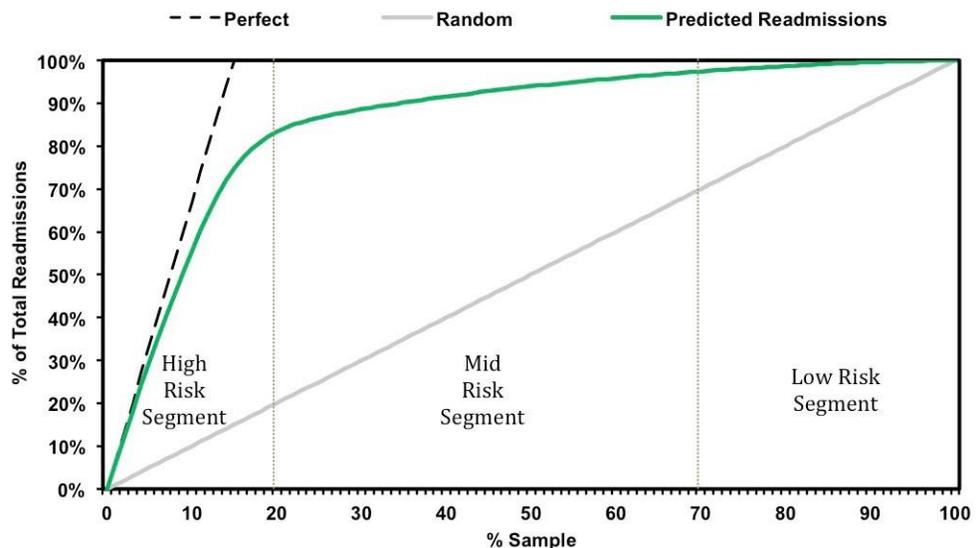


Figure 2

Building a predictive model of this efficacy requires a diverse patient data set, one that spans geography, patients and conditions. In the diversity is the potential to unlock subtle multi-factorial relationships. Generally, the data within a single provider operation lacks sufficient diversity to build stable and highly predictive models. The process next requires expertise in accessing third party data about the patient, household, neighborhood or environment and understanding the limitations about any such external data. Finally, you need the data modeling skills to convert the experiential information into stable and calibrated predictive models.

While building the model is part one of utilizing whole-patient insight, actually changing the patient experience for better outcomes requires additional steps. The predictive model information should be converted into flags, tools or other forms of easily digestible insight. Clinicians and administrators need to be able to quickly interpret the predictive insight at their specific moment of truth, which could be at the bedside or on admission, or even when the patient is off campus. Because the patient health challenge extends over time and across venues, predictive insights need to be integrated with various clinical and patient-engagement work lists, work queues, and interventions. While some of the value in the predictive insight is for providers to be more informed in communicating with their patients, much of the value is in prioritizing and targeting programs, outreach, check-ins, and routines. Performance analysis needs to occur to track outcomes so that continuous improvement occurs, both in terms of uniform use of the data, and more effective program design.

Figure 3:
Process transformation is greatest and sustained when predictive analytics are seamlessly integrated into existing work routines, work queues and screens.

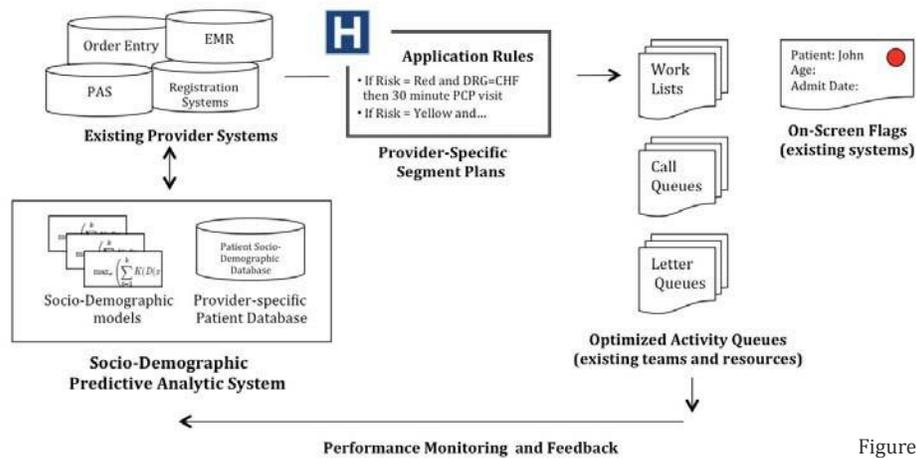


Figure 3

Robust predictive analytics of this type can be applied at virtually any time in the patient-provider relationship: before, during or after treatment. Program matching can occur to prioritize resources while the patient is on-campus or away from the provider's care. In the acute care setting, addition of these socio-demographic predictive analytics will improve the education of, and engagement with, virtually every patient and these insights will enable better time and resources allocation for providers. With this system, providers will be able to determine which patients may require specialized focus and support. Providers can focus content, programs, and themes to match the patient risks and challenges. These factors enable improved discharge planning and readmission management, not only by supporting better communication but also by optimizing numerous follow-up programs.



A true population health initiative will also employ this approach with the healthy or “well” outpatient population, who providers strive to engage with behavioral modification and health maintenance programs in order to avoid disease states or future hospitalizations. Many of the same socio-demographic elements which predispose a patient to failed discharge or readmission, place a patient at increased risk for unplanned admission to the hospital. Home stability, access to nutritious food, and adequate financial resources all weigh heavily upon consumer health. Insight into these and other drivers, at any point along the care continuum, is a critical factor in our efforts to understand and treat the whole patient.

As noted, providers can’t be inundated with more information, but must be prompted at specific moments with targeted insight. If we are going to realize the potential of whole-patient predictive analytics, the systematic and standardized approach must be integrated into the existing clinical workflows and electronic environments within which providers currently work. Data is great – actionable data is better – data seamlessly integrating into workflow and influencing what a clinician does in real time is best. Providers are on the verge of disparate system overload. The right data in the right place, at the right time, and in the right form is what they need. Providers want fewer and more comprehensive systems to facilitate their workflow, and only if there is meaningful improvement in practice efficiency and clinical efficacy as a result of these systems will meaningful adoption of it occur.

Changing the impact a clinical community has on its patients, while remaining within the economic model of our current healthcare system, requires that we understand the whole patient. Specialized organizations have the technology to enable this for providers; organization with data, modeling, and deployment expertise. If properly applied, these technologies and socio-demographic insights will lead providers to a more informed patient view. This will enable specific and targeted interventions to improve patient outcomes for the sick, and better overall health maintenance for those patients who are well.

About the author: Randy K. Hawkins, MD is Chief Medical Officer at 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.