Predictive analytics in health care combines analytic tools, predictive modeling techniques, and patient and population data to make predictions about which patients will get sicker, need care, or require resources in the future. This approach applies the power of statistics and intuition to data patterns to determine—predict—the likelihood that an event will occur. The goal of predictive analytics in health care is to help providers improve health in the community by managing patients’ health risk. This, in turn, contributes to managing financial risk arising from value-based reimbursement contracts. Predictive analytics helps providers refine decision-making that improves health outcomes, efficiency and cost effectiveness.

Predictive analytics is a set of mathematical techniques used to stratify a population according to its risk of a health outcome. The goal is to identify opportunities for intervention before a health outcome occurs to MINIMIZE risk and costs.

Health centers should start with their EHR to source data for predictive analytics. Most EHR vendors provide analytics capabilities as part of their core, or as an add-on, product. But to build rich predictive models of patient and population behavior and outcomes requires multi-dimensional data from a variety of sources. For example, social determinants of health (SDoH) data is very valuable in understanding the drivers of health and outcomes. SDoH data are particularly useful in segmenting populations and predicting health behaviors and barriers to care that impact risk. Much SDoH data is collected by health centers within their EHR; it can be supplemented by additional data from community partners such as human services providers and community-based organizations. Claims, pharmacy and health service data can be integrated from external sources to enrich EHR data. Data sharing and integration are fundamental to predictive analytics, and depend upon creating and leveraging partnerships with hospitals, other providers, payers and other organizations. Integrating data from many
sources creates what is known as “big data”, but bigger is not necessarily better. Health centers should think about what data is most useful and consider utilizing a data warehouse or Health Information Exchange (HIE) where available.

Decisions

Data are used to make predictions and support decision-making and care at the patient and population levels. At the population level, aggregating data on all patients enables analytic models to stratify the population into sub-groups based on a condition or set of risk factors. Health centers can then use this stratification to address clinical care, outreach and communications, patient engagement activities or other interventions for a particular risk group. For example, the model could be used to allocate care management capacity, targeting the most expensive, high-intensity resources to only the sub-group of patients with the highest risk scores.

The use of real-time predictive analytics in clinical decision-making accelerates achievement of the Triple Aim of improving population health and patient experience, and reducing costs. Modeling patient health, demographic and SDoH data helps health center staff understand and care for patients. For example, data and modeling can be used to establish a patient’s risk score to then trigger clinical decision support algorithms, create EHR alerts, or activate a set of orders during the clinic encounter. Predictive models can be built to help clinical staff proactively address patient health behavior, adherence, chronic disease management or other factors that contribute to risk of negative outcomes.

Strategic decision-making can be improved through predictive analytics. Analytics models can mine data to identify trends in cost or health outcomes, to evaluate and improve QI efforts and improve the bottom line. Identifying and understanding trends can support marketing and staffing decisions relevant to developing new service lines.

Applications

Predictive analytics can be used by health centers to implement patient engagement, care management, contract management and negotiation, and quality improvement. Understanding the level and distribution of risk within a patient population can help health centers strategically target care and patient outreach, and address risk proactively.

Examples

HealthLinc in Valparaiso, Indiana has begun to assemble the “big data” that will support predictive analytics. This means combining Uniform Data Systems (UDS), EHR, and quality data with claims and experience data to provide a population health snapshot. Applying statistical algorithms to these data is planned as a future goal for this health center. La Maestra Community Health Center in San Diego County, California conducted a predictive modeling project to improve adherence among patients with diabetes, and has had early success in improving adherence. Further study will build upon these results to incorporate SDoH data.

Learn

Implementing predictive analytics requires deciding whether to build capacity in-house or through outsourcing or partnerships; adoption of the right tools; recruiting, training and allocating staff with the right skills; and collecting and integrating the right data. Learn more about how your health center can use and prepare for predictive analytics and be ready to take advantage of these technologies as they become increasingly available and affordable for health centers in the future. Additional resources about using data for population health management, SDoH and predictive analytics are available on HITEQ.