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## Perspective

# A strengths-based data capture model: mining data-driven and person-centered health assets

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## ABSTRACT

With health care policy directives advancing value-based care, risk assessments and management have permeated health care discourse. The conventional problem-based infrastructure defines what data are employed to build this discourse and how it unfolds. Such a health care model tends to bias data for risk assessment and risk management toward problems and does not capture data about health assets or strengths. The purpose of this article is to explore and illustrate the incorporation of a strengths-based data capture model into risk assessment and management by harnessing data-driven and person-centered health assets using the Omaha System. This strengths-based data capture model encourages and enables use of whole-person data including strengths at the individual level and, in aggregate, at the population level. When aggregated, such data may be used for the development of strengths-based population health metrics that will promote evaluation of data-driven and person-centered care, outcomes, and value.

**Key words:** strengths, risks, value-based care, health assets, health data

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## INTRODUCTION

In this era of health care, given resource constraints and new payment models, there has been a focus on the value of care, which can be defined differently based on the adopted perspective from payers, clinicians, health care industry, caregivers, or patients.<sup>1</sup> From an economic viewpoint, the value of care is the achieved health outcomes per dollar spent.<sup>2</sup> This need catalyzes a shift towards risk management to boost performance in health care that is applicable to payers, providers, and patients alike. However, risk predictions and care management solutions intended to improve health care generally lack a whole-person perspective that includes social and behavioral determinants of health, as well as patient problems and strengths.<sup>3–5</sup> There is a critical need to represent and capture such data in the electronic health record (EHR) to align with the emerging paradigm shift towards strengths-based, whole-person, value-based care.<sup>2–6</sup>

The use of problem lists as the center of patient records proposed by Dr. Lawrence Weed in the late 1960s<sup>7</sup> still defines current health care practice and documentation in the United States. A problem-oriented health care infrastructure, while a useful information and knowledge management strategy, perhaps unintentionally emphasizes documentation and management of negative aspects of patient health status; rather than considering a whole-person perspective consisting of both problems and strengths.<sup>3,8</sup> Today, health care is being redefined to move beyond the current primary health care information model around management of illnesses, data silos, and narrow use cases towards a person-centered integrated care, research, wellness, and community ecosystem.<sup>9</sup> Accompanied with these changes, new data sources have emerged including clinical practice and documentation of individuals' strengths to create an innovative vision and solution.<sup>3,10–12</sup> Scholars and clinicians have

demonstrated that there is an opportunity to examine such a strengths-based whole-person model using an existing standardized terminology, the Omaha System.<sup>3,6,12–15</sup> The purpose of this article is to explore and illustrate the incorporation of a strengths-based data capture model into risk assessment and management by harnessing data-driven and person-centered health assets using the Omaha System.

## STRENGTHS, STRENGTHS-BASED APPROACH AND THE OMAHA SYSTEM

### Strengths and strengths-based approach

Strengths are defined as health assets that present themselves as skills, capacities, actions, talents, potential, and gifts in each individual, each family member, each team member, the family as a whole, and the community.<sup>8,16</sup> A strengths-based care approach is a whole-person, person-centered intervention that leverages the use of the positive, the potential, and what is working to address problems and deficits to capitalize and mobilize strengths to support health.<sup>17</sup> It is based on a positive relationship among providers and patients that employs strengths and supports emotional as well as physical well-being.<sup>16,18–20</sup> However, merely capturing a staying-positive outlook could also neglect problems and deficits.<sup>21</sup> Hence, in the context of health care, strengths data should be meaningful and useful to support better health and health outcomes. From a whole-person perspective, both strengths and problems of individuals and populations need to be considered and made visible in data.<sup>22</sup> Such data can be utilized to improve health care value and patient health.

### The Omaha System

The Omaha System<sup>12</sup> consists of three inter-related valid and reliable components: (1) the Problem Classification Scheme to assess health (including 42 Problem concepts); (2) the Intervention Scheme to describe care management and services (including 4 Categories and 75 Targets); (3) the Problem Rating Scale for Outcomes to measure Knowledge, Behavior, and Status in relation to an identified Problem concept (1 = lowest to 5 = highest). The Omaha System is a standardized vocabulary for health and health care. It is intended to taxonomically and simply describe all of health as 42 defined Problem concepts within four holistic Domains: Environmental, Psychosocial, Physiological, and Health-related Behaviors. The Problem concept terms and definitions are intended to be neutral. Problem concept-specific terms may be used to represent and capture both positive (strengths) and negative (signs/symptoms) attributes, which are not mutually exclusive.<sup>12</sup> For example, within the Environmental domain, *Difficulty buying necessities* is a sign/symptom of the Income problem concept, while *Having sufficient funds* is a strength. Within the Psychosocial domain, *Mood swings* is a sign/symptom of the Mental health problem concept, while *Mental wellbeing* is a strength. Within the Physiological domain, *Rash* is a sign/symptom of the Skin problem concept; while *Intact skin* is a strength. Within the Health-related Behaviors domain, *An unbalanced diet* is a sign/symptom of the Nutrition problem concept, while *A balanced diet for age/condition* is a strength.

### Strengths-based Omaha System Research

Strengths-based research has been conducted by many different health care disciplines.<sup>3,8,12,13,15,16,18–20,23</sup> Early studies using the Omaha System have explored whole-person data capture at both individual and community levels, including strengths as well as

problems.<sup>3,6,13–15</sup> It was feasible to use the Omaha System to classify and quantify strengths and needs of older adults with chronic conditions<sup>3,6</sup> and to capture community-level strengths such as *Presence of faith communities* (Spirituality problem concept) and *Access to fresh produce* (Nutrition problem concept).<sup>14</sup>

An exploratory study of 242 residents in senior living communities using de-identified EHR data showed that all residents had at least one problem indicated by signs/symptoms and had more strengths than signs/symptoms (on average, residents had 16 strengths and 14 signs/symptoms).<sup>15</sup> The most frequent signs/symptoms were *Difficulty with bathing* (Health-related Behaviors/Personal care problem concept—52.1% of sample), *Difficulty with money management* (Environmental/Income—46.7%), *Diminished judgment* (Physiological/Cognition—44.6%), and *Unable to take medications without help* (Health-related Behaviors/Medication regimen—44.6%). The most frequent strengths were *Maintains good relationships with family* (Psychosocial/Interpersonal relationship—71.5%), *Good oral hygiene* (Physiological/Oral health—70.7%), *Regularly eats a balanced diet* (Health-related Behaviors/Nutrition—62.8%) and *Extensive family engagements* (Psychosocial/Social contact—60.3%). Residents who had more strengths than signs/symptoms ( $n = 137$ ) compared to those with more signs/symptoms than strengths ( $n = 105$ ) had higher average overall Omaha System Knowledge (3.2 vs. 2.4;  $P < .001$ ), Behavior (3.9 vs. 3.2;  $P < .001$ ), and Status (3.7 vs. 3.1;  $P < .001$ ) scores. These findings align with and extend previous research among older adults with chronic conditions<sup>3,17</sup> and demonstrate the potential to conduct data-driven comparisons of strengths and problems across populations and settings. Such whole-person data capture could inform clinical judgment regarding care for patients so that effective and person-centered approaches could be created and implemented in their care. For example, patients who have strengths in Psychosocial Domain (*Someone to drive to appointments*) and Health-related Behaviors Domains (*Medication adherence*) may need different recommendations and approaches to care compared to patients who experience signs/symptoms in these areas.

## RISK PREDICTION AND MANAGEMENT

In health care, risk assessments are employed to provide anticipatory guidance in preventing an individual's health problems.<sup>23</sup> The increased use of comprehensive EHRs and advancements in data mining offers promising opportunities for application of existing risk metrics and for development and validation of new risk prediction models.<sup>24</sup> Similar to the problem focused assessment infrastructure, the use of risk to estimate future health status gives rise to probability predictions<sup>25</sup> that do not reflect strengths an individual could leverage to enhance health. Risk is differently described as risk analysis, risk assessment, and risk management; and risk is often assessed to inform health promotion and disease prevention, health risk reduction, and public health research.<sup>26</sup> Risk predictions may bias clinical decisions due to the problem-based perspective. For example, frailty is a common metric used to predict health status for older adults, and such metrics include only problems and signs/symptoms.<sup>27</sup> Metrics may better predict overall wellbeing if strengths are incorporated.

Behavioral and lifestyle changes have often been seen as influential factors on the outcomes of disease management. Health policymakers have turned their concern toward health outcomes, cost-effectiveness, and preventive measures to maximize the value of health care.<sup>26</sup> Risk management has long been recognized to be important in this regard,

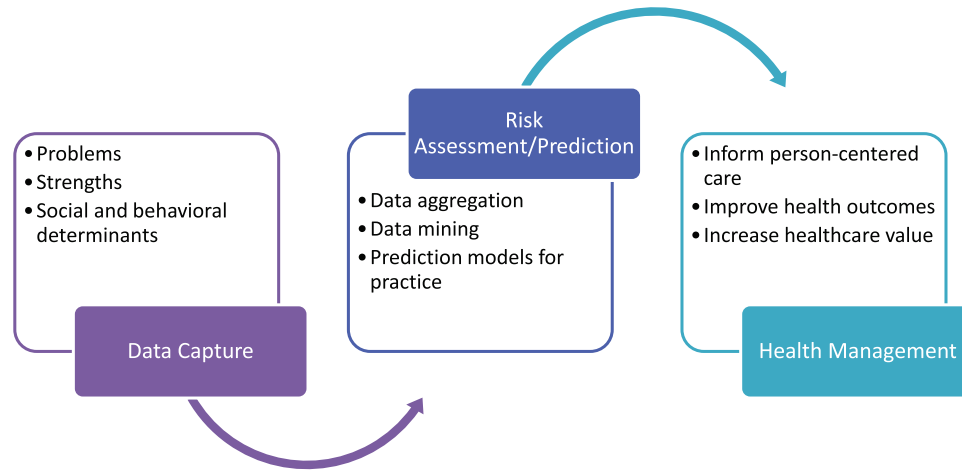


Figure 1. Strengths-based data capture model.

and is often associated with environmental, social, and behavioral factors beyond traditional medical care. Therefore, capturing a patient's strengths not only aligns with the Institute of Medicine (IOM) recommendation to document data about social and behavioral factors in EHRs,<sup>4,5</sup> but also presents a potential to better use patient strengths to improve their health outcomes and return in health care value. When health care is perceived to be driven by "care markets" (*"homo economicus"*), the health care return in value has more to do with solutions for problems by addressing "more markets, more complete markets, more perfect markets, more financialization, new technologies, new ways to monetize" and "abandons the project of individual or collective mastery of existence" (ref. 28, p. 28). However, management of behavioral and lifestyle factors using patient strengths imply patient engagement, self-management, and personal responsibilities with the underlying principle that humans are essentially "caring people" (*"homines curans"*) and "care must be adequately and equally provided for all, and all must contribute their fair share to care" (ref. 28, p. 28). In this situation, care markets function within the contexts of interaction with patients. Patients' behaviors impact their own health management and associated health care outcomes. Leveraging the use of their strengths may create positive results and better risk management.

## A STRENGTHS-BASED DATA CAPTURE MODEL

To move beyond a problem-based data framework that correlates problems with health risks, we need a data capture model that generates whole-person information and knowledge to improve health outcomes. We propose a strengths-based data capture model that illustrates the necessary components of a data-driven approach to whole-person care. Data reflecting a whole-person assessment including social and behavioral determinants as well as problems and strengths must be routinely captured using a consistent terminology as described above. Adopting a consistent terminology will enable the use of sharable and comparable data for information exchange, data aggregation, and reporting. Large data sets generated based on this model may be mined to inform the development of metrics for value-based risk prediction models for various populations. Improved health management can then follow, using a data-driven approach to plan interventions that address risk and leverage strengths, in order to maximize health outcomes and value.

Person-centered, precision care research and services recognize and emphasize individual differences and partnership with patients.<sup>29,30</sup> This is a paradigm shift divergent from traditional care perspectives toward personalization,<sup>28</sup> and results in a shift of responsibility in risk-based management from providers to patients. From this person-centered perspective, person-centered data capture should be present at the point of care and services, making patients full partners in data capture as well as care. Thus, a strengths-based data capture model assumes that patients will be involved as central partners in self-assessment of strengths and needs. Furthermore, focusing on the whole-person perspective in aggregate data will create opportunities to take a more inclusive and positive approach to the understanding of population health. Risk predictions based on risk assessments are usually produced by trending the aggregated data at the population level and applying as clinical guides and recommendations in patient care. When data standards that incorporate strengths and problems are used within EHRs, interoperable and sharable data between patients at both individual level and population level will facilitate both a person-centered approach and a scalable information management system. This model is envisioned by informaticians with the goal of using data to inform and improve health, and staying adaptable and scalable according to patient-specific needs and strengths.<sup>31,32</sup> It is incumbent upon all stakeholders including patients to work together to jointly define the notion of whole-person health for patients with multiple challenges and needs.

## CONCLUSION

The perspective presented in this article and illustrated through our research both exists today and is futuristic. There is a critical need for use of a strengths-based vocabulary for risk assessment and management to realize the potential of strengths and enhance health value. The Omaha System has been used to operationalize and capture data as described in this innovative model and care process. The whole-person model built upon both problem-based risk predictions and strengths will enable a paradigm shift from deficit to whole-person health that includes both problems and strengths. We recognize this as a major groundbreaking endeavor with regard to who, what, and how to define and use data to promote health, and prevent and manage disease, and we welcome conversation to advance

and further develop the model across disciplines, populations, and settings.

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## CONTRIBUTORS

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