

Informatics Stack		
Stack Level	To-Be	Comments
World	Population health management	CMS [†] developed the AHC [‡] Model to address a critical gap between clinical care and community services in the current health care delivery system by testing whether systematically identifying and addressing the HRSNs of Medicare and Medicaid beneficiaries impacts total health care costs and utilization, increases the quality of care, and improves health. Through the model, CMS will support clinical and community partnerships—coordinated by a “backbone” organization—among clinical delivery sites, community service providers, and state Medicaid agencies. Clinical delivery sites—hospitals, clinics, doctors’ offices, and other clinical settings—will serve as the crucial entry point for the model by serving as the place of screening for all Medicare and Medicaid beneficiaries for unmet needs across five core HRSN domains: housing instability (e.g., homelessness, poor housing quality), food insecurity, transportation difficulties, utility assistance needs, and interpersonal safety concerns (e.g., intimate-partner violence, elder abuse, child maltreatment).
Organization	A non-profit healthcare-delivery organization: ImprovingHealth	The leadership strongly believes that only 20% of health outcomes are determined by medical factors, and that social factors are responsible for 80% of health outcomes. Six months ago, they mandated that each of their clinical delivery sites screen all Medicare Beneficiaries using the HRSN screening tool. The hope from ImprovingHealth’s leadership was that by screening these members, clinical staff would then be able to identify health-related social needs and connect the beneficiaries to appropriate resources both in the clinical and community setting.
Role	Patient, Social Worker, Physician, Third-Party vendor, Senior Director of Informatics	As opposed to the current “as-is” situation, we include more owners for the process in the proposal for the “to-be” situation to help fair distribution of workload.
Function	<ul style="list-style-type: none"> • Patient: Fills an electronic core HRSN* form • Social worker (Site Leader): Assesses the severity of the needs in patients with positive screening and refers to the 	In these proposed functions, multiple perspectives of the process are organized while they were missed in the “as-is” situation. First, there is an assigned site leader for the clinical

	<p>appropriate community resources or for further assessment by the physician. In addition, he is responsible as a site leader for achieving Key performance indicators (KPIs) of the site as well as supporting both patients and physicians by responding to any feedback and addressing training needs, or any technical or administrative issues along with the senior director of informatics.</p> <ul style="list-style-type: none"> • Physician: assesses the patients with severe HRSN and refers them to the appropriate community resources. • Third-party vendor: develops a web application that integrates with the EMR and provides the electronic forms to the patients, social workers, and physicians as well as dashboards and analytics to ImprovingHealth central office. • Senior Director of Informatics: monitors the real-time data and provides support to the frontliner upon need in the form of incentives for high performance, investigation for any issues, and ensures periodic training and continuous education and feedback. 	<p>care delivery site with clear responsibilities in supporting the both patients and physicians and taking over any day-to-day issues. Then, the patient is engaged in the process being responsible for filling his screening form digitally, which goes with the HRSN screening tool developers' recommendation. The physicians are preserved for the cases of severe needs only to give them more chance to do their clinical work. The Senior Director of Informatics is assigned for monitoring the whole process in timely manner without waiting for second monthly reports. Finally, the third-party vendor of the decision support web application is responsible for maintenance of the system to ensure functionality and confidentiality.</p>
Workflow	<ol style="list-style-type: none"> 1. While booking the visit either online or via the call centre, the patient receives SMS contains the link to the electronic core HRSN screening tool 10 questions. 2. After filling the form, the system directs the patient according to his score. The patients with positive screening for any of the 5 core domains will be directed to book a virtual short visit with the social worker. 3. The social worker assesses the patient severity of needs. If the patient is classified to have a severe HRSN, the system will refer him/her for further assessment by the physician, otherwise, they will be directed to appropriate community resources. 4. The physician will assess only patients with severe HRSN, explain to them how important the support for their social needs is for their health outcomes, and refer them to the appropriate community resources. 5. The system automatically generates both real-time dashboards and periodic reports about the important KPIs 	<p>In this workflow, most of the process is done digitally even before the beneficiary arrives the care delivery site. This saves staff's time and effort as well as cost of printing large stacks of inefficient paper forms. Utilising a decision support software for the simple repetitive steps of the process, like scoring and directing, preserves the human effort and time for the more important part of the process that needs empathy and human-to-human interaction. This results in improving care of the patients both clinically and socially. Central leadership timely monitoring helps for early detection and management of issues as well as highlighting the good performance that deserves appreciation of the staff. In the downtime, the site leader will take over the role and function of the patient and the system using the phone call to ask the patient and fill the form before the visit and direct him accordingly. Forms is to be entered in the system later on after downtime.</p>

	e.g., percent of screened patients among all Medicare beneficiaries seen in the site over a specific period. 6. However, a backup simple paper-based workflow is kept for downtime periods.	
Information System/Module	1. Heuristic model. 2. Data aggregator.	1. Heuristic model: It directs the patient to the appropriate level of support based on scoring system of the core HRSN screening. 2. Data aggregator: it provides real-time statistics about HRSN screening process to ImprovingHealth central office, both numeric and visual in dashboards as well as time-framed periodic reports.
Module	HRSN management module	A special software that is developed by a third-party vendor and integrates with the EMR.
DIKW	IF...THEN.... Rules: 1. IF screening is positive for any of the 5-core social needs THEN refer the patient to book a virtual visit with the social worker. 2. IF answer to question #1 is not "I have a house" OR answer to question #2 is not "None of the above" THEN screening is positive for housing instability. 3. IF answer to question #3 is not "Never true" OR answer to question #4 is not "Never true" THEN screening is positive for Food Insecurity. 4. IF answer to question #5 is not "No" THEN screening is positive for Transportation Needs. 5. IF answer to question #6 is not "No" THEN screening is positive for Utility Needs. 6. IF A value greater than 10 when the numerical values for answers to questions 7-10 are summed THEN screening is positive for interpersonal safety	As the input for the system is limited to checkboxes selection, it's unlikely to have language concerns. However, to make the system more generalizable, the answers could be coded in backend of the application and this code is the one used in the logic functions. For example, "No" option can have the code (03), so whatever the language used in the frontend, it still indicates the same in the backend.
Technology	As a web-based application, any device with internet access can be used. e.g., laptops, mobile phones, tablets etc.	This gives more liberty and flexibility for all roles. Everyone can access the system anytime anywhere without restriction to a specific paper or device.

*Health-Related Social Needs

†The Centres for Medicare & Medicaid Services

‡Accountable Health Communities

