

VNS Health Case Study: Improving HVLDL Performance by 61% with Predictive Analytics

As one of the nation's largest nonprofit home and community-based healthcare organizations, VNS Health is dedicated to making compassionate care and treatment options for serious illness simpler to understand, easier to access and meaningful in outcomes. Of the 41 providers of hospice care serving some 50,000+ patients across New York State¹, VNS Health ranks as one of the largest, with over 6,000 annual admissions and an Average Daily Census (ADC) of 1,200.

Recognizing that early identification of risk factors and health indicators is critical to ensuring the appropriate level of care at each stage of the end-of-life journey, VNS Health has developed a suite of AI-driven predictive tools that analyze thousands of data points to identify patients who fit specific risk profiles.

Leveraging predictive algorithms helps to facilitate earlier identification of patients along their disease trajectory. This enables more timely discussions regarding patient and family preferences, and helps providers tailor end-of-life services that meet each of their individual needs and circumstances.

Hospice care can often be an upsetting or avoidable topic for many. Being able to predict and to plan ahead for changes in health and care needs, can reduce critical service gaps and significantly improve quality of life for patients with serious illness.

Problem Statement / Objective

In May 2022, the Centers for Medicare and Medicaid Services (CMS) introduced the Hospice Visits Last Days of Life (HVLDL) score into the Hospice Quality Reporting Program (HQRP). VNS Health's leadership team announced an executive-level objective for 2023, to improve HVLDL scores and to outpace both the New York State and national averages.

Sources:

¹Home Care Association of New York State "State of the Industry 2022". <https://infogram.com/2022-hca-state-of-the-industry-report-1h8n6m3kj1ovj4x>



Specific Challenges with Alternative Solutions

With an increased organizational focus, VNS Health's hospice operations teams were in search of creative solutions to help identify and respond to changes in health more quickly. Team leaders and field clinicians were looking for new ways of addressing the many long-term challenges in delivering high-quality hospice care, as shown below.

Solution

The VNS Health Business Intelligence and Analytics team developed an evidence-based Machine Learning (ML) algorithm, designed to examine each hospice patient's case and pinpoint key clinical indicators of expiration within the next seven days. The model was trained using over 1.9M records from almost 10,000 historical patients.

The predictive algorithm stratifies patients as low, medium, or high-risk by analyzing 1,498 structured data points in their medical records, combined with additional unstructured data input by clinicians. This risk stratification is then prominently displayed alongside the latest clinical evaluation for the patient, and a day-by-day calendar detailing recent and upcoming scheduled visits.

The dashboard is designed to enhance the identification of imminent patients, so that hospice care team managers can efficiently schedule the appropriate number of visits to these patients during their last days of life.

"I call it predicting the unpredictable," says Bonnie Lauder, vice president of operations for VNS Health Hospice. "Symptoms often become very complex as the end of life nears, and even very experienced clinicians can struggle to predict the exact course of disease. Physical, emotional, and environmental factors are all part of each person's unique end-of-life experience."



PROBLEM

HOSPICE TEAM CHALLENGE

MORTALITY DASHBOARD SOLUTION

Complex Conditions

Symptoms of serious illness can be difficult to recognize, even for experienced clinical staff. This challenge can be amplified by varying levels of experience across the team.

Evidence-based machine learning algorithm, designed to examine each hospice patient's case for clinical indicators of expiration within the next seven days.

Shortage of Clinical Staff

Staff cannot visit every patient daily. Team leaders need to accurately identify imminent patients requiring scheduled visits, which is made difficult to manage by capacity and logistical issues.

Dashboard lists patients with highest risk of imminence so that clinicians can prioritize patient visits, based on where care is needed the most at the time.

Limited Visibility to Patient Data

Hospice Team Leaders do not have a single view of all the patient data they need from multiple sources.

Summarizes actionable insights into a single view, guiding operational decision-making.

Piloting, Performing and Scaling

In Q3 2022, the Mortality Risk Dashboard was made available to three hospice teams, who received training on how to take actionable insights that would guide their operations. For eight weeks, the dashboard demonstrated a high accuracy in identifying imminent patients, which did not immediately translate to improved HVLDL scores.

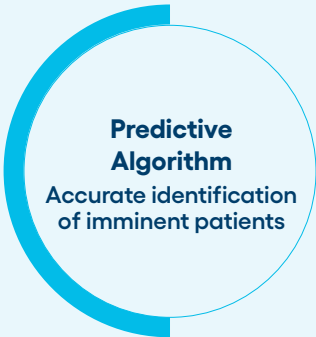
Analysis of the dashboard and operations during this pilot period showed that utilization of the dashboard was low, and that the hospice teams were unable to make sufficient visits to patients that were stratified as either medium- or high-risk.

The next iteration of the pilot included improved operational workflows, to increase adoption of the dashboard by the hospice teams. This included leveraging risk stratification, to guide capacity plans and prioritize patients for scheduled visits. Hospice managers received additional guidance on how to best utilize the dashboard during their interdisciplinary care team meetings. This resulted in their improved adoption of the tool, as the Mortality Risk Dashboard produced more precise insights and care assignment recommendations.

Following the successful pilot period, all VNS Health hospice care teams were given access to the dashboard, and completed their training for improved operational workflows at the beginning of 2023.

Since its launch, the Mortality Risk Dashboard has generated over over 812,000 scores, for over 10,000 patients.

“If the tool flags a certain patient’s situation as being imminent, the team agrees to shift to daily visits, even before the field nurse recommends it,” explains Milena Zaprianova, clinical director of VNS Health’s Hospice program. Her team is now delivering daily visits to all high-risk individuals.



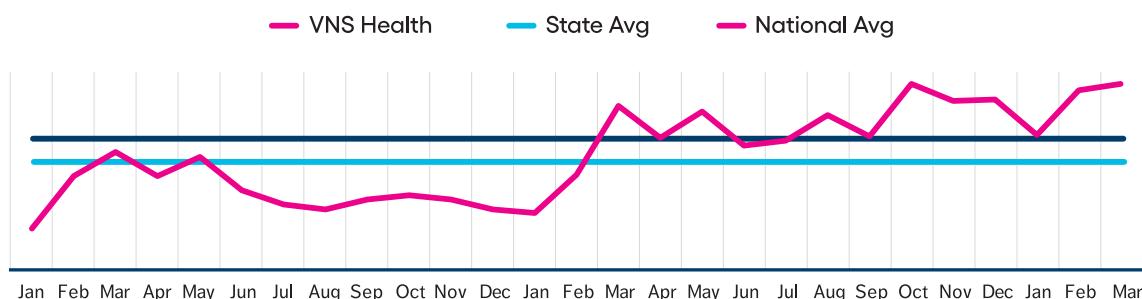
Outcomes

In the first 12 months of adopting the dashboard, VNS Health achieved a 46% improvement in their HVLDL quality scores. As of April 2024, this has grown to a 61% improvement. Within the first quarter of 2023, VNS Health consistently outpaced New York State's average HVLDL scores, with some branches demonstrating up to an 80% improvement compared to 2022².

"Our team utilizes the Mortality Risk Dashboard to identify individuals who are at high-risk for imminent death, and to develop personalized care plans that address their specific needs and situations, says Diane Blair, VNS Health Hospice Team Manager. "Predictive analytics have supported more meaningful conversations about end-of-life between clinicians, patients and their loved ones. The dashboard has also improved our compliance with meeting the HVLDL measure, while still delivering on our commitment to comprehensive, patient-centered care."

↑ **61%**
HVLDL
improvement

HVLDL Rate January 2022 - March 2024



↑ **25%**
improvement in
first 3 months

Additional Outcomes

Since the implementation of the Mortality Risk Dashboard, VNS Health has seen further improvement in additional quality measures for end-of-life transitions:

- 5% reduction in Type I
- 11% reduction in Type II

Service Intensity Add-Ons (SIAs) are the additional reimbursements offered to hospice providers for meeting the additional care needs of patients in the last 7 days of life. SIA payments are frequently under-utilized in hospice, mainly due to concerns around payer scrutiny, as well as challenges in being able to maximize visit days and duration of visits in the last 7 days of life. Since launching the Mortality Risk Dashboard, VNS Health has been able to achieve an 18% increase in SIA payments.

To learn more about HVLDL and VNS Health's Mortality Risk Dashboard, email solutions@vnshealth.org

"Our hospice patients are going to the hospital less often," adds Lauder. "Another Medicare metric we follow closely is Burdensome Transitions, which focuses on managing hospitalizations, both in and out of hospice care."

By using the dashboard to identify symptoms and to predict home-based support needed in a patient's final days, we can avoid unwanted or unnecessary trips to the hospital. That helps minimize disruptions in care, and results in a better quality of life for our hospice patients and their families."



Sources:

² Performance-related information derived from "Hospice Quality Measures" scorecard developed by VNS Health Business Intelligence and Analytics, October 2023