UNDERSTANDING ESSENTIAL HOSPITALS' EXPERIENCES WITH AI: APPLICATIONS FOR POPULATION HEALTH IMPROVEMENT

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Essential Hospitals Institute leads research, education, dissemination, and leadership development for America's Essential Hospitals. To advance the quality, safety, and affordability of care at essential hospitals, the Institute identifies promising practices in the field, provides professional development training, promotes practice improvements, and disseminates innovative approaches to care. It does this with an eye toward improving individual and population health through community-integrated health care.

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- ECMC
- Eskenazi Health
- Harris Health System
- Henry Ford Health
- Howard University Hospital
- LA Health Services
- Prisma Health
- Spartanburg Regional Healthcare System
- The MetroHealth System
- West Tennessee Healthcare

Their perspectives helped illuminate the opportunities, challenges, and implementation considerations associated with the use of artificial intelligence in clinical settings serving diverse patient populations.

The views expressed in this issue brief are those of Essential Hospitals Institute and do not necessarily reflect the views of The Commonwealth Fund or the participating organizations. Essential Hospitals Institute gratefully acknowledges The Commonwealth Fund for supporting this work.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

For essential hospitals, the value of artificial intelligence (AI) in population health lies not in simply predicting risk, but in using those insights to reach patients and communities with timely, targeted interventions. Hospitals are using AI to identify high-risk patients and communities earlier, prioritize limited resources, and act before problems become crises—through outreach, care coordination, navigation, and community-based support.

Applications include closing preventive care gaps, monitoring risk for chronic and behavioral health conditions, improving insurance enrollment, analyzing patient experience, predicting social risks such as homelessness, supporting maternal health, and combining clinical and community data to guide interventions. Together, these approaches can help hospitals address needs earlier and reduce avoidable high-acuity care.

Successful implementation requires more than accurate models. High-quality data infrastructure, strong governance, cross-sector data sharing, local validation, and ongoing equity monitoring are essential. Essential hospitals Howard University Hospital and Nashville General Hospital highlight the need for modern data systems; LA Health Services and Parkland Health demonstrate the value of integrating health care, public health, and community data; and Spartanburg Regional Healthcare System shows why models must be adapted to local populations. AI can identify where action is needed, but people remain responsible for judgment, outreach, and intervention.

Population health AI is less mature than many clinical and administrative applications, but its potential is growing. As essential hospitals strengthen their infrastructure, governance, and partnerships, AI can become an important tool for advancing prevention, equity, and community health. Essential Hospitals Institute will continue identifying promising practices and supporting responsible implementation across member hospitals.

INTRODUCTION

This brief is part of a series developed by Essential Hospitals Institute on the use of AI by health systems filling a safety net role in their communities. In population health, these tools draw on some of the most sensitive data available—from health care, public benefits, justice, housing, and child and family service systems. These examples show that the value of prediction depends on the action it inspires: whether it stops at a risk score or translates into equitable, timely, and person-centered intervention.

SPOTLIGHT: LA COUNTY HEALTH SERVICES

LA County Health Services' Homeless Prevention Unit pairs predictive modeling with human-centered service delivery. Using linked county administrative data, the program flags individuals at risk of homelessness before they enter the homeless services system, identifying people who might need help. Humans lead everything after that step, which is key to building trust.

Records from multiple county departments (health, mental health, public social services, the sheriff's office, and child and family services) are linked through the LA County InfoHub. Using this data, the model assigns each person a probability score for entering homelessness within 12 months; the program targets clients with a 30 to 33% risk score.

Staff generate risk lists quarterly and conduct an initial screening using county data. In this screening, they verify contact and address information and determine whether individuals meet certain exclusion criteria, such as already experiencing homelessness, being incarcerated, or being under conservatorship. Approximately 72% of individuals on the initial lists clear this screening and are eligible for outreach. Staff then attempt to contact these individuals, primarily by phone, reaching about half. Those who choose to enroll sign consent forms and are assigned to case managers. Services include flexible financial assistance (often $4,000 to $6,000 for single adults) along with referrals to food banks, legal services, and other supports.

The California Policy Lab and County Chief Privacy Officer monitor fairness, false negative rates, and demographic equity. A model can appear effective overall while failing to reach specific populations or creating unequal access to services. Enrollment data has shown high representation of clients of color, over-enrollment of women, and ongoing concerns about under-enrollment of Latino men. Thus, the model may be adjusted to improve equity, even if doing so decreases predictive accuracy.

Outcomes have been strong: 89% of clients exit the program with permanent housing, and enrolled clients experienced 72% fewer appearances in the homeless system over 18 months. Those results came from the full program: governance, case management, equity monitoring, and outreach built around a predictive score. A randomized controlled trial is underway, with results expected in 2027.

POPULATION HEALTH MANAGEMENT AND CHRONIC CONDITION RISK

Beyond social risk prediction, hospitals are using AI to identify and tailor outreach to patient groups at higher risk for chronic conditions. In safety net settings, these tools are most valuable when they help teams prioritize limited resources and intervene earlier. Risk scores that don't lead to action aren't useful, no matter how accurate they are.

Closing Care Gaps and Supporting Proactive Care Management

Preventive and chronic care gaps are often visible but hard to address without consistent follow-up. **Care New England** uses technology-enabled tools to identify needed preventive services and support scheduling, outreach, and documentation. The platform prioritizes patients needing follow-up, automates some outreach and documentation, and helps primary care teams close preventive care gaps at scale. By automating an often-manual process, the tools allow staff to focus their limited resources on patients with the greatest unmet needs.

CareVio, **ChristianaCare**'s care management platform, combines predictive analytics, claims data, demographic information, and real-time clinical data to identify at-risk populations before acute events occur and guide care management interventions. The organization's team-based model includes nurses, social workers, pharmacists, and care coordinators. While the platform monitors patient risk between visits, care teams provide medication support, coordinated follow-up, and direct outreach to prevent avoidable hospitalizations.

The MetroHealth System uses a virtual AI agent to address a different population health barrier: helping patients obtain and maintain health coverage. The agent supports eligibility verification and enrollment for more than 30,000 patients who may qualify for Medicaid, Affordable Care Act marketplace plans, or MetroHealth's charity care programs. Available around the clock and in multiple languages, the tool conducts automated outreach, answers insurance questions, collects eligibility information, and helps patients complete enrollment workflows.

During its first six weeks, the virtual agent generated more than 267,000 patient engagements and helped more than 10,000 patients update eligibility information or enroll in appropriate coverage programs. MetroHealth estimates the initiative could generate $9 million in additional annual reimbursement. Beyond the financial impact, the approach helps reduce coverage-related barriers to medication access, preventive services, chronic condition management, and follow-up care. It also demonstrates how AI can expand outreach to large uninsured and Medicaid populations without a proportional expansion in administrative staffing.

Connecting Clinical Risk with Social and Behavioral Health Needs

Grady Health System has used an AI model to identify patients at high risk of readmission within 30 days and dispatch emergency management services (EMS) staff to follow up. By incorporating social determinants of health, the model connects clinical risk with upstream barriers—unstable housing, limited transportation, and medication access—that can drive avoidable readmissions.

Grady also uses neighborhood-level data to strengthen its maternal health strategy. The health system combines clinical, social, geographic, and public program information to identify maternal populations at elevated risk for poor maternal health outcomes and better understand the community conditions contributing to poor outcomes. AI-enabled analytics and a structured performance-measurement framework help leaders determine where to expand remote care management, home visiting, and other maternal health support initiatives.

The approach also incorporates enrollment trends in Medicaid; Supplemental Nutrition Assistance; and Women, Infants, and Children program enrollment. Changes in these programs can signal emerging coverage or resource disruptions before they affect care continuity across a broader patient population. By monitoring these patterns, Grady can target outreach earlier and direct limited maternal health resources toward neighborhoods with the greatest need. The initiative demonstrates how population health analytics can move beyond individual risk scoring to guide community-level program design and resource allocation.

Bergen New Bridge Medical Center uses NeuroFlow to screen for behavioral health conditions, including depression, anxiety, alcohol misuse, and substance use. The platform goes beyond a one-time screening to monitor changes in behavioral health risk over time and prioritize follow-ups based on severity. NeuroFlow helps care teams identify worsening symptoms across patient populations, prioritize outreach, and connect individuals to behavioral health services before crises occur.

Building Population Health Models for Complex Communities

Howard University Hospital's AI-Driven Computational Medicine and Smart Health Lab is developing models to support earlier disease detection, risk prediction, and population health management. The lab integrates imaging, physiologic, genomic, and behavioral data to better understand disease patterns across populations while emphasizing fairness, transparency, and equitable model development.

Current projects include models for sleep apnea detection using electroencephalogram, echocardiogram, heart rate, and video data; colorectal cancer risk assessment; sickle cell disease research; and Alzheimer's disease prediction. The hospital aims to build scalable population health models that support earlier intervention across diverse communities.

Nashville General Hospital's implementation of Oracle Health CommunityWorks, a centralized electronic health record (EHR), illustrates the importance of foundational data infrastructure for population health analytics. By modernizing its EHR and planning to implement Oracle Health Data Intelligence, the hospital is creating a unified

data environment to identify care gaps, understand utilization patterns, and support population-level analytics. While these capabilities are still being implemented, they underscore that effective population health AI depends on integrated, high-quality data.

To flag concerns that traditional patient satisfaction surveys miss, **ECU Health** partnered with PEP Health to use AI to analyze unsolicited patient feedback collected from online sources. The platform continuously identifies emerging concerns and trends across patient populations, allowing leaders to respond more quickly to barriers affecting patient experience, communication, and access to care.

Medical University of South Carolina's AI Center for Health Innovation and Informatics supports health care and biomedical research. Early applications focus on AI-enabled telehealth, including wearables that monitor patients continuously and flag physiological changes for conditions such as asthma, alongside predictive risk modeling and virtual care for patients with complex needs.

LOCALIZING MODELS FOR SAFETY NET POPULATIONS

Models built on national or commercial data don't always fit the communities essential hospitals serve, where patients experience higher disease burden, greater social risk, and more fragmented care. Hospitals need to validate locally and monitor whether tools perform across their own populations.

Readmissions, heart failure, and asthma risk look different in **Spartanburg Regional Healthcare System**'s service area than in a national dataset. Thus, the health system is weighting data points by location in its predictive models. Conditions such as asthma are shaped by housing quality, environmental exposure, transportation, and medication access as much as by clinical status. A model that does not account for these local factors could miss patients who need support or overprioritize others based on patterns that don't fit.

Harris Health similarly emphasized that predictive analytics depend on high-quality data infrastructure and standardized workflows. Rather than deploying isolated AI models, the organization prioritized modernizing its core technology systems and enterprise governance before scaling predictive analytics systemwide, recognizing that trustworthy population health models require consistent data and coordinated implementation.

SPOTLIGHT: PARKLAND CENTER FOR CLINICAL INNOVATION

The **Parkland Center for Clinical Innovation (PCCI)**'s extensive AI and machine learning program demonstrates how integrated clinical and public health data can support a broader population health strategy. In partnership with Dallas County Health and Human Services, PCCI combines EHRs with demographic, socioeconomic, geographic, and public health data through interactive dashboards and the Community Vulnerability Compass. These tools help identify disparities, locate populations at elevated risk, prioritize limited resources, and design place-based efforts for chronic condition screening and prevention.

PCCI's approach extends beyond identifying individual patients to geographic and community-level analyses, helping hospital and public health partners to identify how health outcomes vary across neighborhoods and determine where outreach, screening, and services can have the greatest effect. It also illustrates the importance of cross-sector collaboration in translating data into coordinated action.

Preterm Birth Prevention

PCCI partnered with the Parkland Community Health Plan to identify pregnant patients at elevated risk for preterm birth. By combining machine learning with clinical data and nonmedical drivers of health, the program enables targeted outreach and prenatal support. Since implementation, the program has reduced preterm birth rates by 20% and increased prenatal visits by 8 to 15%.

Pediatric Asthma Surveillance (PASS)

Developed with Parkland Health, Dallas County Health and Human Services, and community partners, PASS uses predictive analytics to pinpoint children and neighborhoods at risk for poor asthma outcomes. An interactive, community-facing dashboard integrates clinical and community-level data to guide interventions and highlight geographic disparities.

Parkland Trauma Index of Mortality (PTIM)

PTIM analyzes EHR data to estimate a trauma patient's risk of mortality during the first 72 hours of hospitalization. The model has correctly identified 98% of high-risk and 92% of low-risk patients over one year.

HIV Risk Prediction

In collaboration with Dallas County Health and Human Services, Parkland Health and PCCI use a predictive model to connect individuals at increased risk of acquiring HIV with prevention services. PCCI's Community Vulnerability Compass provides the data infrastructure underlying PCCI's AI-enabled tools. The dashboard aggregates neighborhood- and individual-level nonmedical drivers of health alongside EHR and public data to help stakeholders locate vulnerable populations.

CONCLUSION

It's clear that AI plays a key role in supporting clinical decisions, cutting documentation time, helping personalize care, improving patient access, and flagging risks earlier. For essential hospitals, even the smallest improvements in documentation time, diagnostic accuracy, care transitions, or patient access can make a meaningful difference for patients, staff, and the organization.

None of this would be possible without thoughtful implementation. Hospitals need data infrastructure that can support AI tools reliably, governance structures that maintain accountability and monitor for bias, workflow planning that embeds tools into how clinicians already work, processes that keep clinicians responsible for verifying AI-generated output, and ongoing attention to equity (especially when AI is trained on data that may not reflect the patients safety net hospitals serve). Clinician engagement, patient transparency, vendor accountability, and structured evaluation all matter too; the hospitals with the strongest results in this brief are the ones that paired the technology with the organizational work around it.

As AI adoption grows, hospitals, technology partners, policymakers, and funders all have a role in using these tools responsibly. For safety net hospitals, the goal is to use AI in ways that strengthen care, support the workforce, and improve outcomes for the patients and communities that depend on essential hospitals.

APPENDIX: HOSPITAL EXAMPLES

Hospital/Health System	Quick Summary	Page
Bergen New Bridge Medical Center	Behavioral health screening and triage (NeuroFlow)	5
Care New England	AI-powered care gap closure for preventive and chronic care	4
ChristianaCare	CareVio predictive analytics and team-based chronic disease monitoring	4
Grady Health System	AI readmission risk model with SDOH integration and EMS outreach*	5
Howard University Hospital	AI-Driven Computational Medicine Lab; multi-modal population health models*	5
LA County Health Services	Predictive homelessness prevention; 89% housing stability; equity monitoring	4
Medical University of South Carolina	AI for telehealth, predictive risk modeling, and virtual care†	6
Nashville General Hospital	Oracle CommunityWorks EHR; planned AI analytics integration*†	5
Parkland Health/PCCI	Preterm birth prevention (20% reduction); PASS; PTIM (98% accuracy); HIV risk prediction	6
Spartanburg Regional Healthcare System	Localized predictive models for readmission, heart failure, asthma risk*	6