

EVIDENCE BRIEF

SYSTEMS FOR ACTION



Improving Population and
Clinical Health with
Integrated Services and
Decision Support

ABOUT S4A

Systems for Action (S4A) aims to discover and apply new evidence about ways of aligning the delivery and financing systems that support the Robert Wood Johnson Foundation's vision to build a Culture of Health. S4A seeks to identify system-level strategies for enhancing the reach, quality, efficiency, and equity of services and supports that promote health and well-being on a population-wide basis.

THE RESEARCH

IUPUI, an S4A Collaborating Research Center, tested the impact of social, behavioral, and medical co-located services supported by analytics on the health of an urban safety-net population.

The research team utilized three main strategies to align the expertise and infrastructure across fragmented systems so that social determinants of health could be adequately addressed:

- Co-located Social & Behavioral Services
- Risk Prediction Models
- Case Conferences

WHAT'S THE PROBLEM BEING ADDRESSED?

Population and individual health are significantly influenced by social determinants that range from individuals' knowledge and behaviors to community-level characteristics, resources, and conditions. The expertise and infrastructure to address these multiple and diverse challenges are divided among systems that often fail to work collaboratively because of misalignment between their respective delivery of services, strategy, and financing. This misalignment exacerbates inequities, as health care providers often do not have the tools to effectively assess need for non-medical services and connect patients to them in real-time.

Health care organizations that aim to improve outcomes and reduce costs need to attend to social determinants of health that go beyond a single medical encounter. Typically, health care providers have limited information on all the social factors that may contribute to an individual patient's health status, and novel strategies are needed to bring this critical information into point-of-care decision making. In order to improve health care system quality and performance, data from multiple sources and sectors must be leveraged and linked.

SOLUTION TESTED

This project tested the impact of social, behavioral, and medical aligned services supported by analytics on the health of an urban safety-net population. The research team utilized three main strategies, based in the health care system, to align the expertise and infrastructure across fragmented systems so that social determinants of health could be adequately addressed.



1. CO-LOCATED SOCIAL AND BEHAVIORAL SERVICES

Co-located social and behavioral services have the potential to address health challenges and risk factors through cross-sector collaboration. These “wraparound services” include teams of social workers, care managers, peer-recovery coaches, behavioral health specialists, and primary care providers collaborating on patient care. They are able to offer a range of in-house services including financial counseling, social work, wellness coaching, family planning consults, mental health and health care coordination.

2. PREDICTING NEED FOR SOCIAL & BEHAVIORAL SERVICES

Novel analytic tools can support clinical decision-making and link data across systems to improve the quality of care and give health care providers a fuller picture of each patient’s unique circumstances and social determinants of health. This project developed a package of decision support tools to better inform clinical decisions on whether to refer patients for integrated services, utilizing machine-learning algorithms. The algorithm employed clinical and administrative data from electronic health records and health information exchanges, as well as data on neighborhood-level social determinants of health.

3. CASE CONFERENCES

Case conferences bring professionals from various sectors together to discuss patient needs and ensure that cross-sector solutions are employed to meet those needs. In these collaborative team meetings, providers trained in medicine, behavioral health, and social services identify and address patients’ social, financial, legal, and medical needs. This project introduced local public health nurses into case conferences taking place at Federally Qualified Health Centers to enhance cross-sector learning and collaboration.

THE RESEARCH

The research team used retrospective longitudinal analyses, modeling, qualitative research methods, and a pragmatic cluster randomized controlled trial to test strategies for integrating the delivery of medical, public health, and social services.



1. CO-LOCATED SOCIAL & BEHAVIORAL SERVICES

To determine the effectiveness of co-located social and behavioral services, the research team used propensity score matched models, comparing patients receiving wraparound services and a comparison group of patients who did not receive these services. This quasi-experimental design used a difference-in-differences modeling strategy in an 11-year panel of FQHC patients. The research team assessed the impact of the intervention on health care service utilization rates such as ED visits, admissions and readmissions, and their associated costs.



KEY FINDINGS

- More than half (53%) of patients needed wraparound services. Those in need tended to be female, older, more medically complex, and higher utilizers of services.¹
- The most common wraparound services were dietary counseling (49%), social work consult (29%) and behavioral health consult (10%).¹
- Receipt of wraparound services resulted in a 7% reduction in hospitalizations and a 5% reduction in ED visits in the next year. The estimated savings from the potentially avoided hospitalizations is \$76-131 per person receiving wraparound services each year.¹

2. PREDICTING NEED FOR SOCIAL & BEHAVIORAL SERVICES

Researchers determined the impact of community, population and public health advanced analytics in identifying and linking patients to needed integrated services. A pragmatic cluster randomized trial tested the impact of an innovative decision support package that includes population, social determinants, and public health data in identifying and linking patients to needed services. The outcomes of interest were the rate of referrals to wraparound services and the rate of program uptake (e.g. participation in those services).



KEY FINDINGS

- Risk prediction models perform best at predicting revisits to the ED when they include information from multiple sources, including neighborhood data, patient level health record data, and Health Information Exchange data.²
- The predictions increased social work referrals by 65 percent among high-risk patients.³
- Among patients referred for social and behavioral services, the predictions increased kept appointments for these services.³
- Machine learning models can automate screening for patients in need of advanced care for depression.⁴

KEY FINDINGS

- Public health nurse participation in case conferences fosters collaboration, learning, attempts at policy change, and increased cooperation between public health and medical providers.⁵
- Professionals participating in case conferences demonstrated greater awareness of each others' capabilities and expertise.⁵
- The team observed evidence of potential policy changes resulting from the case conferencing to facilitate better alignment across systems – examples included efforts to change Medicaid policies on transportation benefits and greater collaboration between different services for older adults.

3. CASE CONFERENCES

The team used a qualitative approach to study the impact of including a local public health nurse in case conferences. They gathered data through direct observation, semi-structured interviews with case conference participants and a focus group with health department leadership to understand whether including public health enhances multi-disciplinary case conferences, and whether participation in the conferences influences local health department activities.



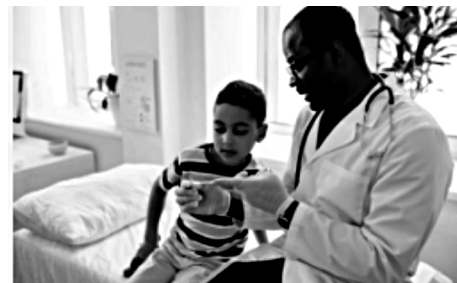
"[For] some things that we never thought were possible, the public health nurse was like, 'Well, we got somebody for that.'"



– Health System Nurse who participated in case conferencing⁵

RECOMMENDED ACTION

Under new payment models, more health care organizations will be turning to service integration and analytics to address population health. There is a continued need to improve access and use of electronic health data to support more effective health care interactions. Providers need access to data in a format that is useful and relevant to their clinical care. The research findings demonstrate the effectiveness of strategies to integrate data and improve decision-making.



HEALTH SYSTEMS CAN IMPROVE OUTCOMES AND REDUCE COSTS THROUGH OFFERING WRAPAROUND SERVICES

The research provides evidence that co-locating wraparound services that address social determinants of health into medical care can reduce health care utilization and lead to substantial cost savings. As health care delivery systems assume more responsibility for patient outcomes and reducing costs, they should consider wraparound services as an effective strategy, especially for complex patient populations. The findings were based on a single institution's safety net population and may not apply in other settings, so replication studies in different settings are needed.

HEALTH SYSTEMS SHOULD UTILIZE ADVANCED ANALYTIC METHODS TO IDENTIFY PATIENTS IN NEED OF ADDITIONAL CARE

Risk prediction models are a promising strategy to ensure people are referred to needed services. These analytic approaches are most useful when they draw on broad information sources, including Health Information Exchanges. Prediction model may not be generalizable to other populations or data systems. The data used in the modeling may not be available in other systems or settings.

INTEGRATING PUBLIC HEALTH NURSES INTO CASE CONFERENCING IS A "MUTUALLY BENEFICIAL" STRATEGY TO ALIGN SYSTEMS

The public health sector is infrequently engaged in case conferencing despite its important role in addressing social determinants of health. Based on this evidence, health systems should consider engaging public health nurses in case conferencing to align sectors in improving care for patients and addressing social determinants of health. The research team is developing a case conferencing guide that summarizes steps to establishing successful case conferencing. Organizations interested in initiating case conferences with public health may need to develop formalized data-sharing policies.

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[3] Vest JR1, Menachemi N2, Grannis SJ3, Ferrell JL4, Kasthurirathne SN5, Zhang Y6, Tong Y6, Halverson PK7. Am J Prev Med. 2019 Apr;56(4):e125-e133. doi: 10.1016/j.amepre.2018.11.009. Epub 2019 Feb 14. Impact of Risk Stratification on Referrals and Uptake of Wraparound Services That Address Social Determinants: A Stepped Wedged Trial.

[4] Kasthurirathne SN1,2, Biondich PG1,3, Grannis SJ1,3, Purkayastha S4, Vest JR1,2, Jones JF4. *J Med Internet Res*. 2019 Jul 22;21(7):e13809. doi: 10.2196/13809. Identification of Patients in Need of Advanced Care for Depression Using Data Extracted From a Statewide Health Information Exchange: A Machine Learning Approach.

[5] Vest JR1, Caine V1, Harris LE1, Watson DP1, Menachemi N1, Halverson P1. *Am J Public Health*. 2018 May;108(5):649-651. doi: 10.2105/AJPH.2018.304345. Epub 2018 Mar 22. Fostering Local Health Department and Health System Collaboration Through Case Conferences for At-Risk and Vulnerable Populations.