Health Care Hotspotting in the United States

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Sector(s): Health

J-PAL office: J-PAL North America

Location: New Jersey, United States of America

Sample: 800 patients with complex needs

Target group: Adults

Outcome of interest: Health outcomes

Intervention type: Health care delivery Preventive health

AEA RCT registration number: AEARCTR-0000329

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Research Papers: Health Care Hotspotting — A Randomized, Controlled Trial, The Camden Coalition Care Management Program Improved Intermediate Care Coordin...

Partner organization(s): Camden Coalition of Healthcare Providers

The high concentration of health care spending in a small share of the population has generated interest in interventions that can reduce health care spending and improve health care quality by targeting high-need, high-cost patients of the health care system. In this study, researchers evaluated the impact of a well-known care transition program that provides intensive, time-limited clinical and social assistance to patients of the health care system with high costs and complex needs. Researchers found no impact on the rate of six-month hospital readmission. However, the program did increase post-discharge ambulatory (outpatient) care, a key component of care coordination. These results suggest that care coordination programs on their own, even when implemented as intended, are not enough to reduce hospitalizations for patients with complex needs.

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Health care spending in the United States is heavily concentrated. Five percent of the population accounts for 50 percent of annual spending; one percent accounts for almost one quarter of annual spending. This has generated interest in how to reduce costs and improve the quality of care delivery through interventions targeting patients with very high use of health care services. Also referred to as high-need, high-cost patients, this small group of individuals with medically and socially complex needs and

frequent hospitalizations accounts for a disproportionately large share of health care costs.

There are a number of promising observational studies of interventions targeting high-need, high-cost patients. However, regression to the mean—the tendency for patients selected as exceptionally high-cost patients at a moment in time to move closer to average cost over time—may lead observational studies to produce misleading estimates of program effects.

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The Camden Coalition of Healthcare Providers (the Coalition) uses real-time data on hospital admissions to identify high-need, high-cost patients, an approach referred to as "Hotspotting." Their program—the Camden Core Model— is a time-limited, intensive care transition program that targets high-need, high-cost patients living in Camden, New Jersey.

In 2012, the median household income in Camden, New Jersey was $25,681 in comparison to $69,667 for the state of New Jersey overall; two-fifths of Camden residents live below the federal poverty line.[1] The study population represented less than one-half of one percent of the Camden population but accounted for 11 percent of Camden hospital expenditures. Prior to their index admission, approximately three-quarters of the study population were single, divorced or widowed, one-half had less than a high school degree, and three-fifths reported needing help with mobility. Almost the entire study population (95 percent) was not employed, and 40 percent had been diagnosed with a substance abuse disorder during the index admission. Forty-five percent of the study population was covered by Medicaid as their primary insurer.

The Camden Core Model has received national attention as a promising intervention, and federal funding has expanded versions of the model to other cities. To rigorously investigate their nationally-recognized program in Camden, the Coalition partnered with the researchers in 2014 to design a prospective randomized evaluation.



Care management service providers conduct a home visit in Camden, New Jersey

Photo credit: Lynsey Addario

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In this study, researchers evaluated the impact of the Camden Core Model on subsequent health care utilization. Patients who were eligible and consented were randomly divided into two groups: an intervention group that received the program and a control group that was not enrolled in the Camden Core Model and received the usual standard of care.

The time-limited intervention included intensive clinical and social components. Intervention group patients were enrolled while in the hospital. Upon return home, patients were engaged by a multidisciplinary team of registered nurses, social workers, licensed practical nurses, community health workers, and AmeriCorps health coaches. The team worked with each patient to address individualized needs as they transitioned from being in the hospital to being at home. Team support services included accompanying patients to initial primary and specialty care visits, coordinating follow-up care and medication management, conducting blood pressure and blood sugar checks, coaching patients in disease-specific self-care, and helping patients apply for social services and appropriate behavioral health programs. On average, an intervention group patient received approximately eight home visits; median program duration was 92 days.

Eligibility was limited to adults (ages 18-80) living in Camden. Additional criteria for inclusion in the study were: at least two hospital admissions in the last six months at any of four Camden-area hospitals, at least two chronic conditions, and at least two of the following: five or more active outpatient medications, difficulty accessing services, lack of social support, a mental health comorbidity, an active drug habit, or experiencing homelessness.

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The intervention had no statistically significant impact on the rate of hospital readmission within six months of hospital discharge. Intervention group patients had a statistically insignificant 0.8 percentage point increase in six-month hospital readmissions (relative to the control group rate of 62 percent). There was also no impact on readmissions over shorter (one month) or longer (one year) time frames, or on mortality.

The results suggest challenges in reducing hospital readmission rates for a medically and socially complex patient population with very high health care utilization rates. While randomized evaluations of some other care transition programs have found that they reduced readmissions by as much as 15-45 percent in the Medicare population, the Camden Core Model served a very different population: younger, with more diverse medical needs, greater social complexity, and much higher health care utilization (prior hospital use was nearly twice that of patients in most previous successful care transition programs).

The study results also underscore the importance of using randomized evaluations to measure the impact of interventions targeting patients with high health care utilization rates. While the results from this study indicate no impact on the rate of hospital readmission, a study comparing readmission rates within the intervention group alone before and after participating in the program would have suggested substantial reductions in readmissions. This is because high-need, high-cost patients are typically targeted for intervention during periods of high health care utilization, often when their illnesses are flaring, and many such patients will naturally return to lower rates of utilization. This phenomenon, known as regression to the mean, can lead observational studies to produce misleading estimates of program effects.

Researchers conducted a follow-up analysis to explore the effects of the program on post-discharge ambulatory (outpatient) care for the subset of patients (70 percent) enrolled in Medicaid. Accessing timely ambulatory office-based care was just one element of the care coordination program but was an intermediate goal for which researchers could observe outcomes in both the treatment and comparison groups and where there was uncertainty about implementation quality in the original study.

Researchers aimed to understand whether the lack of impact on hospital readmissions was due to a failure of implementation or a failure of the program's theory of change. In other words, were individuals not being connected to timely office-based care, muting the effects of the program on future readmissions? Or, were individuals being connected to ambulatory care, but that care did not reduce hospital readmissions? The follow up analysis found that although many participants still did not receive post discharge appointments, the intervention increased the percentage of participants with at least one ambulatory visit within fourteen days by 15.3 percentage points (relative to the control group rate of 27.1 percent). These effects persisted over time, with the percentage of the treatment group with at least one ambulatory visit still 7.5 percentage points higher 365 days after discharge (relative to the control group rate of 82.5 percent) and were comparable to what other care coordination programs had achieved. The program also increased the number of patients receiving any durable medical equipment.

The results suggest that care coordination programs on their own, even when implemented as intended, are not enough to reduce hospitalizations for patients with complex needs and extremely high use of the health care system. In response, the Camden Coalition is including housing and legal services in their model in order to increase the focus on non-clinical support.

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1. U.S. Census Bureau, "INCOME IN THE PAST 12 MONTHS (IN 2012 INFLATION-ADJUSTED DOLLARS) ," 2012. American Community Survey, ACS 1-Year Estimates Subject Tables, Table S1901, 2012, accessed on December 21, 2023, https://data.census.gov/table/ACSST1Y2012.S1901?q=income%20camden%20city%20new%20jersey