Demonstrating the Effect of Social Services on Population Health Outcomes and Costs Among Patients Engaged in Care Management in Brooklyn

Rachel Leep, MPH, Hannah Godlove, MPH, Rob Cimino, MBA, Shari Suchoff, MPP, Charles DeVito, Natalie McGarry, Elizabet Shvets, Sara Kaplan Levenson, MPH, MSW, Karen Nelson, MD, MPH
Maimonides Medical Center Department of Population Health

BACKGROUND

Recognizing the important role of social determinants in supporting overall health, the Maimonides Medical Center (MMC) Department of Population Health, with support from the New York State Health Foundation, studied the impact that connecting Medicaid members to different types of social services may have on healthcare utilization and cost. The goal of this study was to identify opportunities to invest in the social service infrastructure in Brooklyn to address social determinants of health as part of health system transformation efforts currently underway.

METHODS

Literature Review
- A search of relevant journal articles and white papers was conducted to (1) explore the relationship between social determinants of health and healthcare utilization and cost outcomes and (2) identify distinct categories of social services.
- Most literature selected for review was published between 2008 and 2016.
- Six domains of social service interventions were identified: Housing, Food Assistance, Income Assistance, Legal Services, Peer Support, Vocational Training.

Patient Sample
600 patients that met the following inclusion criteria were randomly sampled:
- ✓ Medicaid member assigned to the Brooklyn Health Home
- ✓ At least nine months of care coordination during 2014
- ✓ Care management progress notes in Brooklyn Health Home's online care management platform indicating a demonstrated potential need in at least one of the target social service domains

Cohort Creation
- Care management progress notes for patients were manually reviewed to determine patients' need for and receipt of each of the six identified social service domains.
- Project manager led team of four reviewers, determined the coding structure, and conducted regular inter-rater reliability checks.

Study Design
- Pre-post analysis was used to assess the impact of social services on healthcare utilization and cost outcomes for eight cohorts of patients engaged in consistent care management in Brooklyn (see Intervention Receipt Patient Cohorts table).
- Utilization and cost data from the pre-intervention period (Medicaid claims data from 2013) and the post-intervention period (Medicaid claims data from 2015) were compared.
- Four healthcare utilization indicators were included (# of Emergency Room (ER) visits, # of inpatient admissions, # of patients with any ER utilization, # of patients with any inpatient utilization).
- Two healthcare cost indicators were included (total cost to Medicaid of ER utilization; total cost to Medicaid of inpatient utilization).
- Statistical tests:
  - Nonparametric tests of statistical significance were used for the analyses because of the non-normal distribution of the dependent variables.
  - The Wilcoxon signed-rank test for pre-post differences in continuous variables was used for number of ER visits and inpatient admissions and cost of ER visits and inpatient admissions. The McNemar test for pre-post differences in binary variables was used for number of patients with any ER utilization and number of patients with any inpatient utilization.

RESULTS

Descriptive Statistics

Patient Sample Demographics (n = 599)	n	%
Gender		
Women	275	46%
Men	324	54%
Age (as of intervention period, 2014)		
Age 18-44	226	38%
Age 45-64	323	54%
Age 65 and older	50	8%
Race/Ethnicity		
Black, not Hispanic	305	51%
White, not Hispanic	173	29%
Hispanic	41	7%
Other	37	6%
Asian or Pacific Islander	17	3%
Unknown	14	2%
Native American or Alaskan Native	12	2%

Intervention Receipt Patient Cohorts

Intervention Receipt Cohort (n = 599)	# of Patients
Housing	66
Food assistance	35
Income assistance	27
Legal service	33
Peer support	10
Vocational training	15
Any intervention receipt*	153

*includes patients in the sample who received at least one of any of the six social service interventions

Overview of ER and Inpatient Utilization and Cost Outcomes, Post-Intervention Period

Intervention Receipt Cohorts	Emergency Room			Inpatient		
	Visits	Members w/ Utilization	Cost	Admissions	Members w/ Utilization	Cost
Housing (n = 66)	▽	▽	▽	▽	▽	▽
Food Assistance (n = 35)	△	▽	△	▽	▽	▼
Income Assistance (n = 27)	▽	▽	△	▽	▽	▽
Legal Service (n = 33)	▽	▽	▼	▽	▽	▼
Peer Support (n = 10)	△	△	△	△	△	△
Vocational Training (n = 15)	▽	▽	△	△	▽	△
Any Intervention (n = 153)	▽	▽	▲	▼	▽	▼
All Patients (n = 599)	▼	▽	▼	▼	▽	▲

▼ Positive Impact – statistically significant   ▽ Positive Impact – not statistically significant   ▲ Negative Impact – statistically significant   △ Negative Impact – not statistically significant

- Similar to previously published findings, results indicate that **housing, food assistance, income assistance, legal services, and vocational training interventions may be associated with reduced healthcare utilization and costs** among this study population.
- Overall, the patients in the study experienced statistically significant reductions in number of ER visits, number of inpatient admissions, and ER-related Medicaid costs.

CONCLUSIONS

- Results suggest some association between social service intervention and reduced healthcare utilization and costs among a population of patients engaged in consistent care management in Brooklyn.
- Findings provide useful preliminary insights into social service receipt and its impact on healthcare utilization and cost outcomes.

Study Limitations
- Social services receipt data was abstracted through a qualitative review of free-text care management progress notes, which are difficult to code.
- Patient sample size was limited due to challenges in abstracting free-text social service receipt data; the small cohort sizes limited the statistical significance of the analyses and the generalizability of the findings to a larger population.
- It is possible that peer support was not associated with reduced healthcare utilization and costs in this study population because of the small peer support intervention cohort size, and because patients who receive peer support often have challenging health conditions including serious mental illness (SMI).
- Lack of statistical significance in many of the reductions in utilization and cost observed could be due, in part, to the small cohort sizes.
- Limited follow-up data available about the actual receipt of social services; information such as length of time a patient remained housed or connected to a service was often not available.

PUBLIC HEALTH IMPLICATIONS

Legal Assistance Pilot Program
- The MMC Department of Population Health developed a pilot program that expands an existing legal assistance clinic model (New York Legal Assistance Group (NYLAG)'s LegalHealth Clinic).
- The legal clinic provides patients referred by partner organizations with legal assistance services to address a variety of social determinants of health.
- The pilot leverages a training series, *Social Determinants and the Law,* provided by NYLAG and 1199SEIU Training and Employment Funds, which trains care managers and other providers to better recognize social needs among their patient populations.
- Following successful implementation of the program's pilot year, a second year of implementation has begun.
- The MMC Department of Population Health is currently monitoring and evaluating the pilot to further understand the impact of intervening on the social needs of patients on healthcare utilization and cost.
- Evaluation indicators include: program participant demographics; categories of need for legal intervention; appointment adherence rates; healthcare utilization data pre- and post- intervention. The MMC Department of Population Health will begin collecting additional data about legal interventions and intervention outcomes during the second year of program implementation.

Opportunities for Further Research and Intervention
- Further qualitative analysis of patients' care management documentation to better understand the utilization trends observed in the data
- Further investigation of the levels of severity of housing need among patients, which may have driven ER and inpatient utilization
- Analysis of total cost of care for the patient sample, including outpatient, primary care, pharmacy, and other types of health services
- Appropriate follow up interventions and quality improvement initiatives based on findings from the progress note review and utilization and cost analysis