Does follow-up after an emergency department visit for mental illness improve utilization based outcomes?

Kimberley H. Geissler

University of Massachusetts-Amherst
School of Public Health and Health Sciences

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My research

- Coordination of care
  - Physician referrals
  - Patient sharing networks
  - Role of clinical, organizational, and geographic factors
- Healthcare access
  - Provider networks in health insurance plans, particularly Medicaid
- Intersection of these

Poll Question #1

- What is your primary role in VA?
  - Student, trainee, or fellow
  - Clinician
  - Researcher
  - Administrator, manager or policy-maker
  - Other

Mental health care quality

- Individuals with serious mental illness pose unique challenges for the healthcare system and contribute to high healthcare costs
- One in eight Emergency Department (ED) visits included a mental health or substance use diagnosis, with increasing rates of ED use for behavioral health needs over time
- Improving coordination of care for individuals with serious mental illness is a priority

Quality metrics in mental health care

- Few widely used measures of mental health care quality
- Primary measure used by health plans is metric in the Healthcare Effectiveness Data and Information Set (HEDIS)
  - Used by Medicare, Medicaid, and private health plans
- Measures whether patient receives follow-up care from a mental health care provider within either 7 or 30 days of an inpatient hospitalization for mental illness

Follow-up rates after hospital visit for mental illness

- Follow-up rates after an inpatient hospitalization vary by
  - race,
  - health plan for-profit status,
  - health plan quality, and
  - health plan volume of patients with mental illness
- Follow-up after an ED visit among Medicaid enrollees was lower among
  - males,
  - African-American enrollees, and
  - those with mood disorders

Does follow-up after hospitalization for mental illness improve outcomes?

- Limited empirical research examining follow-up after inpatient hospitalization for mental illness
  - Even less examining whether benefits associated with increased follow-up after ED visits for mental illness
- Beadles and colleagues (2015) examined association between follow-up after inpatient stay and subsequent outcomes
  - ↑ medication adherence and ↑ outpatient utilization
  - ↑ likelihood of inpatient admission or ED visit in next six months.

Mixed evidence on subsequent use for those w/ follow-up

- Some evidence that follow-up improves community tenure and outcomes
  - Research from Europe suggests individuals without follow-up care after an inpatient hospitalization are more likely to have return ED visits and worse mental health outcomes (Bruffaerts et al. 2005; Klinkenberg and Calsyn 1997)
  - A study of a transitional psychiatry clinic aiming to bridge patients after an ED visit for mental illness found that having a clinic appointment within three days was associated with longer community tenure without a repeat ED visit (McCullumsmith et al 2015)

Mixed evidence on subsequent use for those w/ follow-up

- Other studies suggest that those with follow-up more likely to be rehospitalized
  - In an analysis of individuals who had a psychiatric hospitalization in San Diego County, those receiving outpatient therapy within 30 days were more likely to be readmitted although receipt of case management or medication management was not associated with readmission (Vijayaraghavan et al 2015)

Follow up after ED visit measure

- In 2017, new HEDIS metric of follow-up after an **emergency department (ED)** visit for mental illness introduced
- The use of the measure is based on the transition from ED to outpatient being a targeted opportunity to ensure follow-up care for an individual to avoid treatment disengagement and ED readmission
- However, limited empirical work supports measure's applicability in improving future outcomes including continued engagement in mental health treatment, avoidance of future hospitalizations, and/or improvements in health status

Research objectives

- What are rates of follow-up care after an ED visit?
- Is follow-up care within 7 or 30 days associated with changes in utilization-based outcomes?

Analytic Sample

- Data: Massachusetts All Payer Claims Database (2011-2015)
  - Commercial and Medicaid insurance
- Ages 21-64
- Continuously insured for index visit plus 180 days after
- Identify “index ED visits” with primary diagnosis of mental illness
  - Only those who are discharged from the ED are included
  - One index ED visit per person
- Substance use disorder claims suppressed

Outcome Measures

- Outcomes – 180 days
  1. total medical care costs (excluding index ED visit $),
  2. any all-cause ED visit,
  3. any all-cause hospitalization
- Follow-up: outpatient visit, intensive outpatient encounter, or partial hospitalization with any provider with a primary diagnosis of mental illness
  - Within 7 days
  - Within 30 days

Statistical Analysis

- Cost models: Poisson with robust standard errors
  - Includes individuals with $0 spending in follow-up period
- Binary utilization models: linear probability models with robust standard errors
- Controls:
  - patient age,
  - sex,
  - indicator for any medical care use in 60 days prior to index visit,
  - payer,
  - insurance type (e.g., Preferred Provider Organization, Medicaid),
  - categorical measure of index ED diagnosis,
  - Elixhauser comorbidities,
  - year of ED visit, and
  - 3-digit patient ZIP

Sensitivity Analyses

- The HEDIS measure definition excludes discharges “followed by admission or direct transfer to an acute or nonacute facility within the 30-day follow-up period, regardless of primary diagnosis for the admission”
- We conduct a sensitivity analysis by removing individuals who have an inpatient hospitalization for any diagnosis within 30 days of the index ED visit

Descriptive Statistics

		Follow-up within 30 days	
Mean (Standard Deviation) or %	Overall (N=44,674)	No (N= 27,345)	Yes (N= 17,329)
Index ED visit diagnosis			
Major Depressive Disorder	30.4	25.3	38.4*
Anxiety Disorder	34.9	38.1	29.9*
Schizophrenia	2.3	2.6	2*
Bipolar I Disorder	4.5	3.8	5.6*
Any medical care use in 60 days prior to index ED visit	71.1	67.2	77.2*
Age	38.1 (12.1)	38.3 (12.0)	37.8 (12.1)*
Female	57.6	56.4	59.5*
Insurance type			*
Medicaid	48.1	53.7	39.4
Elixhauser Comorbidities			
Depression	49.1	41.2	61.4*
Psychoses	12.7	11.5	14.5*
Hypertension, Uncomplicated	12.3	12.5	12
Chronic Pulmonary Disease	7.9	7.7	8.1
Diabetes, Uncomplicated	4.7	4.7	4.8

Follow-up rates

		Follow-up within 30 days	
	Overall (N=44,674)	No (N= 27,345)	Yes (N= 17,329)
Follow-up within 30 days	38.8%	0	100%
Follow-up within 7 days	28.4%	0	73.2%
Same day follow-up	15.8%	0	40.7%

Post-ED outcomes

		Follow-up within 30 days	
Mean (Standard Deviation) or %	Overall (N=44,674)	No (N= 27,345)	Yes (N= 17,329)
Total medical care costs in 180-day follow-up period ($)	6392.2 (14889.2)	5157.3 (14091.7)	8341.0 (15873.5)*
All cause hospitalization within 30 days	8.6	4.1	15.8*
All cause hospitalization within 180 days	14.5	9.8	21.9*
All cause ED visit within 30 days	16.7	15.9	18*
All cause ED visit within 180 days	41.3	41.3	41.4

Regression Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Total medical care costs in 180-day follow-up period ($)		All cause hospitalization within 180 days		All cause ED visit within 180 days	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Follow-up within 30 days	0.481***	0.352***	0.121***	0.076***	0.00033	0.00014
	(0.022)	(0.022)	(0.004)	(0.003)	(0.005)	(0.005)
Patient Level Controls?	NO	YES	NO	YES	NO	YES
Number of observations	44,674	44,674	44,674	44,674	44,674	44,674

Sensitivity Analyses

Regression results for association of follow-up within 7 days with subsequent outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
	Total medical care costs in 180-day follow-up period ($)		All cause hospitalization within 180 days		All cause ED visit within 180 days	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Follow-up within 7 days	0.425***	0.313***	0.113***	0.0667***	-0.0122***	-0.0153***
	(0.0219)	(0.0215)	(0.0041)	(0.0038)	(0.0052)	(0.0052)
Patient Level Controls?	NO	YES	NO	YES	NO	YES
Number of observations	44,674	44,674	44,674	44,674	44,674	44,674

Sensitivity Analyses

Regression results for association of follow-up with subsequent utilization outcomes excluding those with hospitalization in first 30 days

	(1)	(2)	(3)	(4)	(5)	(6)
	Total medical care costs in 180-day follow-up period ($)		All cause hospitalization within 180 days		All cause ED visit within 180 days	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Follow-up within 30 days	0.30***	0.26***	0.012***	0.002	-0.002	0.003
	(0.024)	(0.024)	(0.003)	(0.003)	(0.005)	(0.005)
Patient Level Controls?	NO	YES	NO	YES	NO	YES
Number of observations	40,820	40,820	40,820	40,820	40,820	40,820

Sensitivity Analyses

Regression results for association of follow-up with subsequent utilization outcomes excluding those with hospitalization in first 30 days

	(1)	(2)	(3)	(4)	(5)	(6)
	Total medical care costs in 180-day follow-up period ($)		All cause hospitalization within 180 days		All cause ED visit within 180 days	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Follow-up within 7 days	0.280***	0.242***	0.011***	0.00002	-0.014***	-0.013**
	(0.025)	(0.025)	(0.003)	(0.003)	(0.006)	(0.006)
Patient Level Controls?	NO	YES	NO	YES	NO	YES
Number of observations	40,820	40,820	40,820	40,820	40,820	40,820

Sensitivity Analyses

- Results similar when examining association with follow-up within 7 days
- Cost results similar when excluding individuals with inpatient stay within 30 days (per HEDIS measure specifications)
  - No change in inpatient hospitalizations within 6 months associated with follow-up
  - Similar results for ED visits

Main Findings

- Overall follow-up rates are lower than expected (39%)
  - Most follow-up happens quickly (73% within 7 days)
  - Much of this is same-day follow-up (41% of those with 30 days follow-up)
- Follow-up associated with higher costs in subsequent 6 months
  - Much higher inpatient hospitalization rates within 30 days suggest this may be needed care
  - Sensitivity analyses suggest that most of the cost increase is not due to increased inpatient or ED usage for those with follow-up
  - Very small decreases in ED visits associated with follow-up
- Consistent with previous results for inpatient stays
- Further research is needed to establish causality (e.g., large RCT)

Importance of findings

- More than 4% of ED visits have mental health condition or substance use disorder as primary diagnosis
  - increasing rates over time,
  - potential magnitude of problem indicates understanding the implications of timely follow-up care is warranted
  - But are we focusing on follow-up for the “wrong” reasons?

Interpretation

- A large number of interventions have been tried within the ED to support patients with mental illness, with varying levels of effectiveness
- A number of case management programs in ED have been attempted, with some evidence that these may be effective at improving care
- Other models focus on the role of post-discharge care coordination on improving outcomes while reducing costs

Limitations

- The first is that we are limited to a single state, which may lack national generalizability
- The second is that claims involving SUD have censored diagnosis codes in our version of the APCD data
- The third limitation is that we have only retrospective observational data, so we are not able to establish a causal relationship between ED follow-up and subsequent outcomes

Policy considerations

- What should we think about same-day follow-up?
- Many consider follow-up within 7 days clinically meaningful
  - Results show that it is associated with higher costs and more inpatient admissions, but unknown whether these are meaningful engagement with useful care
- Some differences by insurance type, suggest continued focus on Medicaid enrollees important

Next Steps

- Predictors of follow-up
- Does follow-up work better (e.g., at preventing hospital use) for some groups than others?
- Does follow-up result in better medication adherence?

Policy Implications

- Results are of importance to health plans, delivery systems, and providers for improving quality of care and patient outcomes while simultaneously reducing costs
- Securing follow-up care across treatment settings and often across organizational boundaries can be difficult
- Specific follow-up programs and case management programs may be necessary to ensure that targeted follow-up care happens and is effective in meeting a patient's needs
- Future research is needed to examine optimal timing of ED follow-up and examine clinical, demographic, and organizational predictors of follow-up

Questions? Interested? Ideas?

Contact me at
kgeissler@umass.edu

Twitter: @khgeissler

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