Published in final edited form as:

Psychiatr Serv. 2020 October 01; 71(10): 1031–1038. doi:10.1176/appi.ps.201900360.

Exploring publicly reported inpatient psychiatric facility care coordination measures and 30-day “All-Cause Unplanned Readmission after Psychiatric Hospitalization” rates

Ivy Benjenk, B.S.N., M.P.H.,

University of Maryland School of Public Health, College Park, MD

Morgan Shields, M.Sc., M.A.,

Heller School for Social Policy and Management, Brandeis University, Waltham, MA

Jie Chen, Ph.D.

University of Maryland School of Public Health, College Park, MD

Structured Abstract

Objective: The Medicare Inpatient Psychiatric Facility Quality Reporting (IPFQR) program has required inpatient psychiatric facilities to collect and publicly report a suite of quality measures since late 2012. This study aimed to explore the association between facility-level 30-day risk-adjusted all-cause readmission (medical or psychiatric) after psychiatric hospitalization (READM-30-IPF) outcome measure and care coordination process measures in the IPFQR.

Methods: This study used psychiatric facility-level performance data from the IPFQR that is publicly reported on the Hospital Compare website and reflects facility performance from July 2015 to June 2017. This study used a cross-sectional design and linear regression models controlling for hospital and community characteristics and state fixed-effects.

Results: The mean facility-level 30-day readmission rate was 20% (SD=2%) with substantial variation by facility type, ownership status, rurality, and percent of minority county residents. Regression results showed that facilities with top tercile performance on the 7-day mental health follow-up (FUH-7) measure had readmission rates that were significantly lower than facilities in bottom tercile (Coef=−0.58, $p<0.01$), although the magnitude of this difference was small. The readmission measure, however, did not vary by facilities’ performance on discharge plan creation and transmission measures.

Conclusions: Results suggested that facilities have substantial opportunities to reduce readmissions after psychiatric hospitalization. The association between hospital performance on care coordination process measures and the all-cause readmission measure currently included in the IPFQR is minimal. The IPFQR should evaluate whether the measures included in the program are adequately capturing compliance with evidence-based processes and desired outcomes.

Corresponding Author: Ivy Benjenk, Address: School of Public Health Building, Room 3310, 4200 Valley Dr #2242, College Park, MD 20742, ibenjenk@umd.edu, Phone number: 917-697-6063.

Previous Presentations: None

Introduction

Unlike general acute care where there is an overabundance of quality measures and measurement programs, quality measurement in inpatient psychiatry is still in its nascence (1–3). In the Fall of 2012, the Centers for Medicare and Medicaid Services (CMS) debuted the Inpatient Psychiatric Facility Quality Reporting (IPFQR) program, a pay-for-reporting program for inpatient psychiatric facilities (IPFs). This program contains structural and process measures that IPFs must collect and submit to CMS as well as claims-based measures that do not require data collection (4). Quality measures from this program are publicly reported on the Hospital Compare website alongside quality measures from the CMS general acute care quality reporting program and IPFs that fail to participate incur financial penalties (4).

There is a great body of literature describing the merits and limitations of measures included in inpatient non-psychiatric public reporting programs. For instance, readmission measures are common in quality measurement programs. This is because the structures and processes of inpatient care have been found to impact readmission rates, suggesting that readmission rates can act as proxy measures for inpatient quality, and there is often wide variation in performance across facilities with similar characteristics, suggesting opportunities for improvement (5–9). However, superior hospital performance on readmission measures has been found to be related to greater upcoding (10), mortality rates (11), and socioeconomic status (SES) (12).

There has also been little evidence supporting an association between hospital performance on process measures and measures of the outcomes that those processes are designed to impact, including care coordination process measures and readmission outcome measures (13–20). In theory, process measures, which aim to measure compliance with evidence-based processes, should reflect the quality of clinical care at an institution and thus should be associated with outcomes of care (21). In practice, process measures often fail to capture essential elements of evidence-based processes due to feasibility of measurement and thus their ability to measure true clinical quality is limited (21).

Little research has yet to be conducted on the strengths and limitations of the measures in the IPFQR. Since its inception, care transitions have been a major theme in the IPFQR. The program includes process measures of discharge plan development, discharge plan transmission, follow-up appointment attendance, and most recently readmissions (22,23). The “Thirty-Day All-Cause Unplanned Readmission Following Psychiatric Hospitalization” measures the rate of Medicare fee-for-service beneficiaries discharged from IPFs that are readmitted to any inpatient facility for any unplanned medical or psychiatric reason within 30 days of discharge (23).

Our objective was to explore variation in the new psychiatric readmission measure (READM-30-IPF) and to examine the association between the READM-30-IPF and IPFQR care coordination process measures. We hypothesized that better facility-level performance on IPFQR care coordination measures is associated with lower readmission measure (READM-30-IPF) performance.

Methods

Data Source and Sample

We used data from the February 2019 Hospital Compare IPFQR upload. The IPFQR program is a pay-for-reporting program for IPFs (4). The February 2019 upload was the first time that facility-level readmission rates were publicly reported and these rates are based on discharges that occurred from July 2015 to June 2017 (23).

We merged this file with the 2017 and 2018 Hospital Compare IPFQR measure files (reflecting performance in 2015, 2016, and 2017), the 2015 American Hospital Association (AHA) annual survey to capture hospital-level characteristics (24), and the 2015 Area Health Resource File (AHRF) to capture community-level characteristics of the counties in which the IPF is located (25). Institutional review board approval was waived because all data sets are publicly available.

There were 1,631 IPFs listed in the February 2019 IPFQR data file. 1,513 (93%) had readmission scores. 67 (4%) did not have scores because their number of eligible discharges was too small and 51 (3%) did not have scores because they had no Medicare claims for the period or elected to suppress the measure from public reporting. Of the 1,513 IPFs with readmission scores, 74 did not have data on one or more IPFQR care coordination measures (see Appendix 1 for details). 98 were not listed in the AHA annual survey. Seven IPFs did not have corresponding demographic information in the AHRF. Our final sample was 1,343 IPFs (89% of population). The IPFs included in our study had significantly more discharges eligible for the readmission measure (412 vs. 297, $p<0.001$), however there was no statistically significant difference in readmission rates (20% vs. 20%, $p=0.419$).

Measures

“Thirty-Day All-Cause Unplanned Readmission Following Psychiatric Hospitalization”—The new 30-day all-cause unplanned readmission (READM-30-IPF) measure assesses the rate of readmissions for Medicare fee-for-service beneficiaries discharged from IPFs and includes readmissions for both psychiatric and medical conditions (see Appendix 2 for measure details). This measure was added to the IPFQR by the federal rule published on August 22, 2016 and has been endorsed by the National Quality Forum (NQF) (26).

Encounters are excluded from the measure when patients are discharged against medical advice, transferred, readmitted to the same psychiatric facility within two days of discharge, or have planned readmissions (23,27–29). The readmission measure is risk-adjusted for age, gender, principal discharge diagnosis for the index admission, medical and psychiatric comorbidities, or history of suicide attempt/self-harm, aggression, or being discharged against medical advice. The comorbidity and history risk factors are based on claims from the index admission and from the twelve months prior to admission (23,27). The rate that CMS publicly reports is already risk-adjusted and the combines readmissions for medical and psychiatric causes.

Hospital and Community Characteristics—We explored variation in hospital-level readmission rates across characteristics that have previously been found to be associated with readmissions as well as characteristics indicative of external and organizational resources. According to Resource Dependency Theory, organizations do not always control the resources necessary to succeed (30). Hospital-level characteristics included volume of Medicare fee-for-service discharges eligible for the readmission measure, teaching status, system affiliation, freestanding IPF or a psychiatric unit in a general hospital, ownership status, bed size, and Medicaid fraction (31–33). Bed size and Medicaid fraction included non-psychiatric beds in the general acute hospitals. Community-level characteristics included population density, percentage of county residents living in poverty, percentage of county residents that are Black or Hispanic, number of psychiatrists per 10,000 residents, and number of Federally Qualified Health Centers or Community Mental Health Centers per 10,000 residents (5,33,34).

Care Coordination Measures—We also examined the relationship between hospital performance on the new readmission measure and the two sets of care coordination process measures in the IPFQR program: the Transition Record measures and the follow-up (FUH) measures (see Appendix 2).

The manually abstracted Transition Record measures assess whether inpatient providers completed a discharge plan with eleven specific components (“Transition-1”) and if that discharge plan was transferred to the next level of care provider within 24 hours of discharge (“Transition-2”) (35). For a record to be compliant with the “Transition-2” measure, it must first be compliant with the “Transition-1” measure. The denominator for the two measures is the same. (36–38). IPFs began data collection for the Transition Record measures in January 2017 and annual rates are publicly reported, hence we include facility-level scores from the January-December 2017 reporting period in our analysis.

The FUH are claims-based measures that assess the rate of follow-up with a mental health provider within 7 days (FUH-7) and 30 days (FUH-30) of discharge from an IPF for Medicare fee-for-service beneficiaries (35,39). FUH performance is reported annually. We used consolidated data from the July 2015-June 2016 and July 2016-June 2017 measurement periods to align with the readmission measure reporting period. If IPFs had missing data in one of the two years, we used data from the available year.

Data Analysis

We first calculated descriptive statistics for IPFQR measure performance for all IPFs with publicly reported readmission rates and examined the geographic variation in performance. Then, for the IPF’s in our analytic sample, we explored variation within groups (i.e. teaching hospitals) using means, standard deviations, and ranges and variation across groups (i.e. teaching hospitals vs. non-teaching hospitals) using Welch’s t-tests for characteristics with two groups and ANOVA for characteristics with three groups. Continuous variables were categorized into terciles. We also explored the correlation between hospital performance on the care coordination measures and the readmission measure. As the readmission measure had a fairly normal distribution across IPFs (Appendix 3), we used a linear regression model

to measure the association between IPF-level readmission rates and performance on the care coordination measures included in the IPFQR program, while controlling for hospital and community characteristics. We limited our key independent variables to the 7-day follow-up measure (FUH-7) and the discharge plan transmission measure (“Transition-2”) as they capture compliance with their partner measures. We also found significant variation across states and thereby present our models with and without state fixed effects.

We conducted sensitivity analyses using the FUH-30 and “Transition-1” measures as our key independent variables, running separate models for the FUH-7 and “Transition-2” measures, and using logistic regression to compare low readmission to high readmission IPFs and found similar results. All analyses were conducted in STATA 15/IC and we considered p-values less than 0.05 to be significant.

Results

There were 1,513 IPFs with publicly reported readmission (READM-30-IPF) rates. The mean IPF-level 30-day readmission rate was 20% (SD=3%) and ranged from 11% to 36%. IPFs with publicly reported readmission rates had an average 7-day follow-up rate (FUH-7) of 30% and an average 30-day follow-up rate (FUH-30) of 53%. On average, facilities created and transmitted plans 47% of the time (“Transition-2”).

We found great amounts of variation across states as shown in the maps in Figure 1 and Appendix 4. We found mean IPF-level 30-day readmission rates to be lowest in Washington (16%), Minnesota (18%), and New Hampshire (18%) and highest in Rhode Island (24%) and Florida (24%). We found 7-day follow-up rates to be highest in New Hampshire (54%) and Maine (46%) and lowest in Nevada (17%) and Mississippi (17%). Transition record transmission was highest in Nebraska (75%) and Arkansas (72%) and lowest in the District of Columbia (10%) and Washington (15%).

In Table 1, we describe the characteristics of the 1,343 IPFs in our sample. Performance on the IPFQR measures does not markedly differ between the population and our sample.

In Table 2, we explore the variation in readmission measure performance across hospital-level and community-level characteristics. Substantial variation appears to be present within grouping. We also compare mean readmission measure performance across categories and find lower mean readmission rates in IPFs that are freestanding psychiatric, public, located in micropolitan areas, and located in counties with lower percentages of residents in poverty and minority residents. We also find lower mean readmission rates in IPFs with less discharges eligible for the readmission measure and hospitals with smaller Medicaid fractions.

In Table 3, we explore the relationship between the care coordination process measure performance and the readmission measure performance. We find a slight correlation between follow-up measure (FUH-7 and FUH-30) and readmission measure performance, but no correlation between discharge plan measure (“Transition-1” and “Transition-2”) and readmission measure performance. On average, hospitals with top tercile FUH-7 and FUH-30 performance have slightly better readmission measure performance.

In Table 4, we present the results of our regression models with and without state fixed effects. Coefficient direction and significance were similar for both models. In the state fixed effects model, IPFs in the top tercile of performance on the 7-day follow-up measure (FUH-7) had on average a 0.58 percentage-point lower readmission rate than IPFs in bottom tercile. There were no significant differences in readmission rates between hospitals in the bottom and top terciles of the discharge plan transmission measure (“Transition-2”).

System affiliated hospitals, freestanding psychiatric hospitals, and public hospitals were associated with lower readmission rates. Readmission rates trended upward as number of discharges eligible for the measure increased, however readmission rates trended downward as overall hospital size increased. Readmission rates trended upward as the percentage of county residents that are Black or Hispanic and the percentage of hospital discharges that are paid by Medicaid increased.

Discussion

We found significant variation in all-cause readmission rates within and between groups, including states, hospital-level characteristics, and community-level characteristics. This variation indicates that there is likely substantial opportunity for IPFs in each of the groups that we examined (i.e. high-SES serving and low-SES serving, freestanding psychiatric and units in general acute care) and for many states to reduce their readmission rates. However, it is unclear from the data publicly presented by CMS if the opportunities for improvement are greatest for readmissions for medical conditions or readmissions for psychiatric conditions as only the combined measure is presented on the Hospital Compare website (Appendix 5).

There is a wide body of literature describing the causes of psychiatric readmissions after psychiatric hospitalization and establishing evidence-based strategies to prevent these readmissions (40–43), but very little literature on medical readmissions after psychiatric hospitalizations. In the absence of literature on why patients are medically readmitted after psychiatric hospitalizations and how psychiatric facilities can reduce these readmissions, the value of reporting all-cause readmission after psychiatric hospitalization rates is currently unclear. We recommend that CMS publicly report these rates separately in order to determine if both are meaningful measures of psychiatric quality. Mental health consumer groups, like the National Association of Mental Illness (NAMI), must also be included in these discussions. If markedly variation in medical readmissions after psychiatric hospitalization is noted across hospitals with similar characteristics, research will be needed to determine if there are structures and processes that capable of improving these outcomes.

Similar to studies of general acute care quality improvement programs (13–15), we also found little association between process and outcome measures; we found no association between facility performance on the discharge plan measures and the readmission measure and only a modest association between facility performance on the follow-up measures and the readmission measure. Even among the 15 facilities in the top fifth percentile of performance on the readmission measure (<14%), performance on the 7-day follow-up measure ranged from 1% to 61% and performance on the discharge plan transmission measure ranged from 0% to 98%.

This lack of association between process and outcome may be related to the design of the measures (44). The care coordination processes being measured have been found to reduce readmissions for psychiatric causes (45), not readmissions for medical causes. The inclusion of readmissions for medical conditions in the outcome measure may be hiding this association. Additionally, like all process measures, the process measures in the IPFQR can only capture aspects of the process that can feasibly be measured. The discharge plan creation measure examines whether eleven specific data elements are included in a paper document, but it does not measure if the document was reviewed with the patient or includes the correct information. The discharge plan transmission measure examines whether the plan was sent, but does not assess whether this information was received (46,47). The IPFQR may want to consider adopting a post-discharge survey to assess the quality of the care transition process from the perspective of the patient, similar to the HCAHPS survey (48).

Using claims to measure mental health follow-up after psychiatric hospitalization may also weaken the association between follow-up and readmission. The percentage of patients that receive mental health follow-up appointments that are billed to Medicare likely varies across facilities (49). Only 55% of psychiatrists accept Medicare and this percentage varies by region (50). Additionally, we found superior performance on the readmission measure among freestanding public IPFs as compared to all other IPFs (18% vs. 20%, $p<0.001$), however freestanding public IPFs had significantly poorer performance on the 7-day follow-up measure (22% vs. 31%, $p<0.001$). Patients being discharged from freestanding public IPFs may be more likely to receive follow-up care at public mental health service providers that do not bill Medicare. A post-discharge survey may also be the only way to accurately capture this phenomenon.

Interestingly, this study also found IPFs in the lowest tercile of Medicare psychiatric discharges to have the lowest readmission rates. The positive relationship between volume and outcomes has long been well recognized in many facets of medical care, including psychiatry (51–54). However, this relationship has not consistently been found for readmissions (32), potentially because greater volume means less time spent with each patient or shorter lengths of stay (32). Psychiatric inpatient length of stay has consistently been found to have an inverse relationship with readmission rates (55–57). Medicare beneficiaries admitted to freestanding psychiatric hospitals have been previously found to have longer lengths of stay than beneficiaries admitted to psychiatric units in general hospitals; this may contribute to their superior on readmission measure performance (49). CMS currently does not publicly report mean length of stay but reporting this metric could be valuable for both clinicians and policymakers.

Limitations

There are several limitations worth noting. First, this was a cross-sectional. Therefore, we cannot make any causal inferences about the relationship between process and outcomes. Similarly, because the unit of analysis is the facility, there should be caution in applying these findings to individual patients. The READM-30-IPF measure only uses data from Medicare fee-for-service claims and results cannot be generalized to IPF performance for patients with other payers. Our findings cannot be generalized to the 170 IPFs with missing

data that we excluded from our analysis. This study cannot determine the association between hospital performance on the care coordination process measures and readmission for psychiatric condition rates because CMS publicly reports a combined all-cause readmission rate.

Conclusion

Quality measurement in inpatient psychiatric is in its early stages. The IPFQR measures have only recently been integrated into the general hospital lookup section of the Hospital Compare website, instead of residing in interaction spreadsheets on a separate section of the website (22,39). As these measures will certainly receive increased attention, it is important that these measures be designed to accurately capture processes and outcomes that are meaningful to individuals with psychiatric illnesses and to identify IPFs that provide high and low quality of care (58).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Disclosures and acknowledgments:

The authors report no financial relationships with commercial interests.

Part of Ms. Shields' time was supported by a predoctoral training grant T32AA007567 from the National Institute on Alcohol Abuse and Alcoholism. Dr. Chen is supported by grants from the National Institute on Minority Health and Health Disparities (R01MD011523) and from the National Institute on Aging (1R56AG062315-01).

References

1. CMS: Fiscal Year (FY) 2019 Medicare Hospital Inpatient Prospective Payment System (IPPS) and Long Term Acute Care Hospital (LTCH) Prospective Payment System Proposed Rule, and Request for Information. Centers of Medicare and Medicaid Services , 2018 Available from: <https://www.cms.gov/newsroom/fact-sheets/fiscal-year-fy-2019-medicare-hospital-inpatient-prospective-payment-system-ipps-and-long-term-acute>
2. Meyer GS, Nelson EC, Pryor DB, et al.: More quality measures versus measuring what matters: a call for balance and parsimony. *BMJ Qual Saf* 21: 964–968, 2012.
3. Shields MC, Rosenthal MB: Quality of inpatient psychiatric care at VA, other government, nonprofit, and for-profit hospitals: A comparison. *Psychiatric Services* 68: 225–230, 2016. [PubMed: 27745537]
4. CMS: Inpatient Psychiatric Facility Quality Reporting (IPFQR) Program. Centers of Medicare and Medicaid Services , 2018 Available from: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/IPFQR.html>
5. Herrin J, St Andre J, Kenward K, et al.: Community factors and hospital readmission rates. *Health Serv Res* 50: 20–39, 2015. [PubMed: 24712374]
6. Clarke A: Readmission to hospital: a measure of quality or outcome? *BMJ Quality & Safety* 13: 10–11, 2004.
7. Ashton CM, Del Junco DJ, Soucek J, et al.: The association between the quality of inpatient care and early readmission: A Meta-Analysis of the Evidence. *Medical Care* 35: 1044–1059, 1997. [PubMed: 9338530]
8. Benbassat J, Taragin M: Hospital readmissions as a measure of quality of health care: Advantages and limitations. *Arch Intern Med* 160: 1074–1081, 2000. [PubMed: 10789599]

9. Selby JV, Schmittiel JA, Lee J, et al.: Meaningful variation in performance: What does variation in quality tell us about improving quality? *Medical Care* 48: 133–139, 2010. [PubMed: 20057330]
10. Ibrahim AM, Dimick JB, Sinha SS, et al.: Association of coded severity with readmission reduction after the Hospital Readmissions Reduction Program. *JAMA Intern Med* 178: 290–292, 2018. [PubMed: 29131896]
11. Wadhera RK, Maddox KEJ, Wasfy JH, et al.: Association of the Hospital Readmissions Reduction Program with mortality among Medicare beneficiaries hospitalized for heart failure, acute myocardial infarction, and pneumonia. *JAMA* 320: 2542–2552, 2018. [PubMed: 30575880]
12. McCarthy CP, Vaduganathan M, Patel KV, et al.: Association of the new peer group–stratified method with the reclassification of penalty status in the Hospital Readmission Reduction Program. *JAMA Netw Open* 2: e192987–e192987, 2019. [PubMed: 31026033]
13. Jha AK, Orav EJ, Epstein AM: Public reporting of discharge planning and rates of readmissions. *New England Journal of Medicine* 361: 2637–2645, 2009.
14. Stefan MS, Pekow PS, Nsa W, et al.: Hospital performance measures and 30-day readmission rates. *J Gen Intern Med* 28: 377–385, 2013. [PubMed: 23070655]
15. Press MJ, Scanlon DP, Ryan AM, et al.: Limits of readmission rates in measuring hospital quality suggest the need for added metrics. *Health Affairs* 32: 1083–1091, 2013. [PubMed: 23733983]
16. Nicholas LH, Osborne NH, Birkmeyer JD, et al.: Hospital process compliance and surgical outcomes in Medicare beneficiaries. *Arch Surg* 145: 999–1004, 2010. [PubMed: 20956770]
17. Heit JA, Crusan DJ, Ashrani AA, et al.: Effect of a near-universal hospitalization-based prophylaxis regimen on annual number of venous thromboembolism events in the US. *Blood* 130: 109–114, 2017. [PubMed: 28483763]
18. JohnBull EA, Lau BD, Schneider EB, et al.: No association between hospital-reported perioperative venous thromboembolism prophylaxis and outcome rates in publicly reported data. *JAMA Surg* 149: 400–401, 2014. [PubMed: 24500768]
19. Rubin HR, Pronovost P, Diette GB: The advantages and disadvantages of process-based measures of health care quality. *Int J Qual Health Care* 13: 469–474, 2001. [PubMed: 11769749]
20. Tsai TC, Joynt KE, Orav EJ, et al.: Variation in surgical-readmission rates and quality of hospital care. *New England Journal of Medicine* 369: 1134–1142, 2013.
21. Parast L, Doyle B, Damberg CL, et al.: Challenges in assessing the process–outcome link in practice. *J Gen Intern Med* 30: 359–364, 2015. [PubMed: 25564435]
22. CMS: Find and compare information about Hospitals. Hospital Compare. Available from: <https://www.medicare.gov/hospitalcompare/search.html>
23. Duseja R, Keenan M: Measure Dry Run: Thirty-Day All-Cause Unplanned Readmission Following Psychiatric Hospitalization in an Inpatient Psychiatric Facility, 2017 Available from: <https://www.qualityreportingcenter.com/en/inpatient-quality-reporting-programs/inpatient-psychiatric-facilities-quality-reporting-program/archived-events/ipfqr-event163/>
24. AHA: AHA Annual Survey Database™. American Hospital Association, 2019 Available from: <http://www.ahadata.com/aha-annual-survey-database-asdb/>
25. HRSA: Area Health Resources Files. Health Resources and Services Administration Available from: <https://data.hrsa.gov/topics/health-workforce/ahrf>
26. NQF: All-Cause Admissions and Readmissions 2015–2017: Technical Report. National Quality Forum, 2017
27. CMS: Inpatient Psychiatric Facility Quality Reporting Program Claims-Based Measure Specifications. Quality Reporting Center, 2018 Available from: https://www.qualityreportingcenter.com/globalassets/ipf-tools-and-resources/181203_fy2019_ipfqr_cbm_specs_508.pdf
28. CMIT: Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF). Centers of Medicare and Medicaid Services, 2019 Available from: https://cmitt.cms.gov/CMIT_public/ViewMeasure?MeasureId=2800
29. Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation: 2016 Condition-Specific Measures Updates and Specifications Report Hospital-Level 30-Day Risk-Standardized Readmission Measures. 2016 [cited 2019 May 4] Available from: http://aann.org/uploads/Condition_Specific_Readmission_Measures.pdf

30. Yeager VA, Zhang Y, Diana ML: Analyzing determinants of hospitals' accountable care organizations participation: A resource dependency theory perspective. *Med Care Res Rev* 72: 687–706, 2015. [PubMed: 26156971]
31. Horwitz LI, Bernheim SM, Ross JS, et al.: Hospital characteristics associated with risk-standardized readmission rates. *Med Care* 55: 528–534, 2017. [PubMed: 28319580]
32. Horwitz LI, Lin Z, Herrin J, et al.: Association of hospital volume with readmission rates: a retrospective cross-sectional study. *BMJ* 350, 2015 Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4353286/>
33. Kalseth J, Lassemø E, Wahlbeck K, et al.: Psychiatric readmissions and their association with environmental and health system characteristics: a systematic review of the literature. *BMC Psychiatry* 16, 2016 Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5100223/>
34. Busch AB, Epstein AM, McGuire TG, et al.: Thirty day hospital readmission for Medicaid enrollees with schizophrenia: The role of local health care systems. *J Ment Health Policy Econ* 18: 115–124, 2015. [PubMed: 26474051]
35. CMS: Inpatient Psychiatric Facility Quality Reporting Program Manual. Quality Reporting Center, 2016 Available from: https://www.qualityreportingcenter.com/globalassets/migrated-pdf/ipf_programmanual_v2.2_20161110_final508.pdf
36. CMS: Medicare Program; Inpatient Psychiatric Facilities Prospective Payment System—Update for Fiscal Year Beginning October 1, 2015 (FY 2016). *Federal Register* 80: 46652–46728, 2015.
37. Buck J, Robinson E: FY 2017 IPPS Final Rule IPFQR Program Changes, APU Determination and Reconsideration Review, 2016 Available from: https://www.qualityreportingcenter.com/globalassets/migrated-pdf/ipf_fy2017fr_apureview_slides_20160908_final.nocel508.pdf
38. Robinson E: Inpatient Psychiatric Facility Quality Reporting Program New Measures and Non-Measure Reporting – Part 2, 2016 Available from: https://www.qualityreportingcenter.com/globalassets/migrated-pdf/ipf_newmeasurespt2_20160119_final.2508.pdf
39. Benjenk I, Chen J: Variation of follow-up rate after psychiatric hospitalization of Medicare beneficiaries by hospital characteristics and social determinants of health. *The American Journal of Geriatric Psychiatry* 27: 138–148, 2019. [PubMed: 30262408]
40. Durbin J, Lin E, Layne C, et al.: Is readmission a valid indicator of the quality of inpatient psychiatric care? *J Behav Health Serv Res* 34: 137–150, 2007. [PubMed: 17437186]
41. Mark T, Tomic KS, Kowlessar N, et al.: Hospital readmission among Medicaid patients with an index hospitalization for mental and/or substance use disorder. *J Behav Health Serv Res* 40: 207–221, 2013. [PubMed: 23430287]
42. Byrne SL, Hooke GR, Page AC: Readmission: A useful indicator of the quality of inpatient psychiatric care. *Journal of Affective Disorders* 126: 206–213, 2010. [PubMed: 20334927]
43. Sfetcu R, Musat S, Haaramo P, et al.: Overview of post-discharge predictors for psychiatric re-hospitalisations: a systematic review of the literature. *BMC Psychiatry* 17: 227, 2017. [PubMed: 28646857]
44. Lesh K: CMS Measures Management System (MMS): Respecifying Measures. Centers of Medicare and Medicaid Services, 2018 Available from: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/Downloads/CMS-MMS-Webinar-BP101-%E2%80%93Re-specifying-Measures.pptx>
45. Vigod SN, Kurdyak PA, Dennis C-L, et al.: Transitional interventions to reduce early psychiatric readmissions in adults: systematic review. *The British Journal of Psychiatry* 202: 187–194, 2013. [PubMed: 23457182]
46. Smith TE, Haselden M, Corbeil T, et al.: Relationship between continuity of care and discharge planning after hospital psychiatric admission. *Psychiatric Services* appi.ps.201900233, 2019.
47. Smith TE, Abraham M, Bolotnikova NV, et al.: Psychiatric inpatient discharge planning practices and attendance at aftercare appointments. *Psychiatric Services* 68: 92–95, 2017. [PubMed: 27582241]
48. Boyer L, Baumstarck-Barrau K, Cano N, et al.: Assessment of psychiatric inpatient satisfaction: a systematic review of self-reported instruments. *Eur Psychiatry* 24: 540–549, 2009. [PubMed: 19699617]

49. Blair R, Brown J, Barry X, et al.: Transitions in care and service use among Medicare beneficiaries in Inpatient Psychiatric Facilities. Washington, DC, Assistant Secretary for Planning and Evaluation, 2019 [cited 2019 Nov 9] Available from: <https://aspe.hhs.gov/basic-report/transitions-care-and-service-use-among-medicare-beneficiaries-inpatient-psychiatric-facilities-issue-brief>
50. Bishop TF, Press MJ, Keyhani S, et al.: Acceptance of insurance by psychiatrists and the implications for access to mental health care. *JAMA Psychiatry* 71: 176, 2014. [PubMed: 24337499]
51. Luft HS, Hunt SS, Maerki SC: The volume-outcome relationship: practice-makes-perfect or selective-referral patterns? *Health Serv Res* 22: 157–182, 1987. [PubMed: 3112042]
52. Druss BG, Miller CL, Pincus HA, et al.: The volume-quality relationship of mental health care: Does practice make perfect? *Am J Psychiatry* 5, 2004.
53. Jørgensen M, Mainz J, Johnsen SP: Admission volume and quality of mental health care among Danish patients with recently diagnosed schizophrenia. *Psychiatric Services* 67: 536–542, 2016. [PubMed: 26725292]
54. Rasmussen LR, Mainz J, Jørgensen M, et al.: Inpatient volume and quality of mental health care among patients with unipolar depression. *Psychiatric Services* 69: 797–803, 2018. [PubMed: 29695225]
55. Heeren O, Dixon L, Gavirneni S, et al.: The association between decreasing length of stay and readmission rate on a psychogeriatric unit. *Psychiatric Services* 53: 76–79, 2002. [PubMed: 11773653]
56. Figueroa R, Harman J, Engberg J: Use of claims data to examine the impact of length of inpatient psychiatric stay on readmission rate. *Psychiatric Services* 55: 560–565, 2004. [PubMed: 15128965]
57. Lin H-C, Tian W-H, Chen C-S, et al.: The association between readmission rates and length of stay for schizophrenia: A 3-year population-based study. *Schizophrenia Research* 83: 211–214, 2006. [PubMed: 16504482]
58. CMS: Overview of the CMS Meaningful Measures Initiative. Centers of Medicare and Medicaid Services, 2018 Available from: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/Downloads/CMS-Meaningful-Measures_Overview-Fact-Sheet_508_2018-02-28.pdf

Highlights

- The new 30-day “All-Cause Unplanned Readmission after Psychiatric Hospitalization” measure (READM-30-IPF) was made publicly available on the Hospital Compare website in February 2019.
- The mean hospital-level all-cause readmission after psychiatric hospitalization rate was 20% and ranged from 11% to 36%.
- Results showed a significant but modest negative association between hospital performance on the 7-day mental health follow-up measure (FUH-7) and hospital performance on the 30-day readmission measure (READM-30-IPF).
- Results showed no association between hospital performance on the discharge plan creation and transmission measures (the “Transition Record” measure) and hospital performance on the 30-day readmission measure (READM-30-IPF).

Figure 1.
Maps depicting state variation in IPF-level performance on the 30-day all-cause Medicare readmission measure (Source: Hospital Compare)

Table 1.

Descriptive statistics of psychiatric facilities with publicly reported 30-day all-cause readmission after psychiatric hospitalization rates (n=1,343)

Variables	Mean	SD/SE ^a
30-Day readmission rate (READM-30-IPF) ^b	20%	SD= 3%
7-Day follow-up rate (FUH-7) ^b	30%	SD=13%
30-Day follow-up rate (FUH-30) ^b	54%	SD=14%
Discharge plan creation rate ("Transition-1") ^b	50%	SD=37%
Discharge plan transmission rate ("Transition-2") ^b	46%	SD=36%
Number of discharges eligible for readmission measure ^b	412	SD= 330
Teaching hospital (%) ^c	42%	SE=1%
System affiliated hospital (%) ^c	68%	SE=1%
Freestanding psychiatric hospital (%) ^c	27%	SE=1%
Ownership: Nonprofit (%) ^c	51%	SE=1%
Ownership: For-profit (%) ^c	31%	SE=1%
Ownership: Public (%) ^c	18%	SE=1%
Bed size: <100 beds (%) ^{c, d}	29%	SE=1%
Bed size: 100–399 beds (%) ^{c, d}	52%	SE=1%
Bed size: >399 beds (%) ^{c, d}	20%	SE=1%
Percent of discharges paid by Medicaid ^{c, d}	23%	SD= 13%
Community type: Metropolitan (%) ^{c, e}	80%	SE=1%
Community type: Micropolitan (%) ^{c, e}	14%	SE=1%
Community type: Rural (%) ^{c, e}	6%	SE=1%
Percent of county residents in poverty ^f	16%	SD= 6%
Percent of county residents Black or Hispanic ^f	28%	SD= 19%
Psychiatrists per 10,000 people ^f	1.28	SD=1.38
FQHC and CMHCs per 10,000 people ^f	0.24	SD=0.32

^a Standard deviation presented for continuous variables and standard errors presented for categorical variables

^b Source: Hospital Compare

^c Source: AHA Annual Survey

^d Includes both psychiatric and non-psychiatric beds/discharges

^e. Metropolitan: area contains a core urban area of 50,000 or more population, micropolitan: area contains an urban core of at least 10,000 population, or rural: not metropolitan or micropolitan

^f. Source: Area Health Resource File

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2.

Variation in 30-day all-cause readmission after psychiatric hospitalization rates across hospital and community characteristics (n=1,343) ^{a, b, c}

Characteristic	Category	Mean	SD	Range	p-value
Teaching	Yes	20.3%	3.0%	11.4%-32.6%	0.6257
	No	20.2%	2.7%	13.2%-30.0%	
System affiliated	Yes	20.3%	2.8%	11.4%-32.5%	0.6788
	No	20.2%	2.8%	12.7%-32.6%	
Inpatient Psychiatric Facility Type	Freestanding Psychiatric Hospital	19.7%	2.9%	11.4%-30%	<0.001 ***
	General Acute Care Hospital	20.4%	2.8%	12.6%-32.6%	
Ownership Status	Nonprofit	20.2%	2.7%	12.6%-32.5%	<0.001 ***
	For-profit	20.7%	2.7%	13.7%-30.6%	
	Public	19.4%	3.0%	11.4%-32.6%	
Total Hospital Size	<100 beds ^d	20.2%	2.7%	13.4%-30.0%	0.858
	100–399 beds ^d	20.2%	2.8%	12.7%-30.6%	
	>399 beds ^d	20.3%	3.1%	12.7%-30.6%	
Community type	Metropolitan ^e	20.3%	2.9%	11.4%-32.6%	<0.05 *
	Micropolitan ^e	19.7%	2.5%	13.2%-26.9%	
	Rural ^e	20.4%	2.9%	14.4%-26.2%	
Number of discharges eligible for readmission measure	Q1 (26-237 discharges)	19.5%	2.6%	12.7%-27.6%	<0.001 ***
	Q2 (238-424 discharges)	20.4%	2.6%	11.4%-28.5%	
	Q3 (425-2488 discharges)	20.9%	3.1%	13.1%-32.6%	
Percent of total hospital discharges paid by Medicaid ^d	Q1 (0%-18.6%)	20.1%	2.8%	11.4%-30.6%	<0.05 *
	Q2 (18.6%-27.0%)	20.2%	2.8%	12.6%-32.5%	
	Q3 (27.0%-79.2%)	20.5%	2.8%	13.4%-32.6%	
Percent of county residents in poverty	Q1 (3.4%-13.4%)	19.9%	2.6%	11.4%-27.6%	<0.01 **
	Q2 (13.5%-17.4%)	20.4%	3.1%	12.6%-32.5%	
	Q3 (17.5%-46.3%)	20.4%	2.7%	13.3%-32.6%	
Percent of county residents that are Black or Hispanic	Q1 (1.2%-15.2%)	19.7%	2.7%	12.6%-27.3%	<0.001 ***
	Q2 (15.2%-35.6%)	20.0%	2.6%	11.4%-28.2%	
	Q3 (35.6%-91.7%)	21.1%	3.0%	13.1%-32.6%	
Psychiatrists per 10,000 people	Q1 (0-0.6)	20.3%	2.6%	13.2%-26.9%	0.7565
	Q2 (0.6-1.3)	20.3%	3.0%	12.6%-32.6%	
	Q3 (1.4-10.7)	20.2%	2.8%	11.4%-30.6%	
FQHC/CMHCs per 10,000 people	Q1 (0-0.1)	20.3%	2.7%	13.2%-29.9%	0.2495
	Q2 (0.01-0.25)	20.1%	2.9%	12.6%-32.5%	
	Q3 (0.25-5.3)	20.4%	2.9%	11.4%-32.6%	

^a.Source: Hospital Compare, AHA Annual Survey

^b.^{*}p<0.05, ^{**}p<0.01, ^{***}p<0.001

^c.Comparisons made using Welch's t-tests for two group categories and ANOVA for three group categories

^d.Includes both psychiatric and non-psychiatric beds/discharges

^e.Metropolitan: area contains a core urban area of 50,000 or more population, micropolitan: area contains an urban core of at least 10,000 population, or rural: not metropolitan or micropolitan

Table 3.

Correlation between hospital performance on the 30-day all-cause readmission measure and care coordination process measures and comparison of readmission measure performance across hospital process measure performance terciles (n=1,343) ^{a, b}

Care Coordination Performance Measures	Correlation Coefficient	Performance Categories	Mean (SD)	ANOVA p-value
7-Day follow-up rate (FUH-7)	-0.094 (p<0.001 ***)	Q1 (0%-24.0%)	20.5% (3.0%)	<0.001 **
		Q2 (24.2%-35.3%)	20.4% (2.8%)	
		Q3 (35.3%-95.8%)	19.8% (2.6%)	
30-Day follow-up rate (FUH-30)	-0.130 (p<0.001 ***)	Q1 (6.1%-47.7%)	20.7% (3.1%)	<0.001 ***
		Q2 (47.7%-59.7%)	20.3% (2.7%)	
		Q3 (59.8%-95.8%)	19.8% (2.6%)	
Discharge plan creation rate ("Transition-1")	0.017 (p=0.543)	Q1 (0%-24%)	20.2% (2.7%)	0.849
		Q2 (25%-77%)	20.2% (2.9%)	
		Q3 (78%-100%)	20.3% (2.8%)	
Discharge plan transmission rate ("Transition-2")	0.021 (p=0.433)	Q1 (0%-20%)	20.2% (2.8%)	0.703
		Q2 (21%-71%)	20.3% (2.8%)	
		Q3 (72%-100%)	20.3% (2.9%)	

^aSource: Hospital Compare

^b*p<0.05, **p<0.01, ***p<0.001

Table 4:

Multivariable linear regression model regressing IPF-level 30-day readmission rates on care coordination measures, controlling for hospital and community characteristics, with and without state fixed effects

(n=1,343) ^{a, b, c}

	Model without state fixed effects			Model with state fixed effect		
	Coef.	95% CI	p-value	Coef.	95% CI	p-value
7-Day Follow-up Measure (FUH-7) Tercile (Ref: Quartile 1)						
Quartile 2	-0.11	-0.46, 0.24	0.542	-0.06	-0.40, 0.28	0.740
Quartile 3 (Highest)	-0.62	-0.99, -0.25	0.001 **	-0.58	-0.98, -0.19	0.004 **
Care Plan Transmission Measure (Transition-2) Tercile (Ref: Quartile 1)						
Quartile 2	-0.03	-0.38, 0.32	0.875	-0.27	-0.60, 0.06	0.113
Quartile 3 (Highest)	-0.02	-0.38, 0.34	0.915	-0.28	-0.63, 0.06	0.108
Eligible Discharges Tercile (Ref: Quartile 1)						
Quartile 2	0.70	0.35, 1.05	<0.001 ***	0.54	0.20, 0.88	0.002 **
Quartile 3 (Highest)	1.37	0.99, 1.75	<0.001 ***	0.99	0.61, 1.36	<0.001 ***
Teaching Hospital	-0.03	-0.39, 0.33	0.874	-0.02	-0.37, 0.33	0.912
System Affiliate	-0.60	-0.96, -0.30	<0.001 ***	-0.40	-0.72, -0.08	0.014 *
Freestanding Psychiatric	-1.55	-1.96, -1.15	<0.001 ***	-1.33	-1.72, -0.93	<0.001 ***
Ownership (Reference: Nonprofit)						
For-profit	0.29	-0.10, 0.68	0.105	0.26	-0.12, 0.65	0.122
Public	-0.73	-1.15, -0.32	<0.001 ***	-0.53	-0.93, -0.12	0.011 *
Hospital Bed Size (Reference: <100 beds)						
100-399 beds	-0.43	-0.81, -0.05	0.026 *	-0.42	-0.79, -0.05	0.028 *
>399 beds	-1.14	-1.70, -0.59	<0.001 ***	-0.93	-1.47, -0.39	0.001 **
Percent Medicaid Discharges	0.02	0.01, 0.03	0.003 **	0.02	0.00, 0.03	0.005 *
Community Type (Reference: Metropolitan) ^d						
Metropolitan	-0.19	-0.66, 0.29	0.439	0.15	-0.32, 0.62	0.526
Rural	0.48	-0.23, 1.20	0.185	0.78	0.09, 1.48	0.027 *
Percent Poverty (Continuous)	-0.02	-0.06, 0.01	0.203	-0.04	-0.08, -0.00	0.035 *
Percent Black or Hispanic (Continuous)	0.04	0.03, 0.05	<0.001 ***	0.03	0.02, 0.05	<0.001 ***
Psychiatrists per 10,000 (Continuous)	0.01	-0.10, 0.12	0.913	-0.03	-0.15, 0.09	0.622
FQHCs/CMHCs per 10,000 (Continuous)	-0.72	-1.20, -0.23	0.004 **	-0.39	-0.89, 0.11	0.126
Constant	20.27	19.51, 21.02	<0.001 ***	20.54	19.79, 21.29	<0.001 ***

^a Source: Hospital Compare, AHA Annual Survey, Area Health Resource File

^b $R^2 = 0.1629$; Adjusted $R^2 = 0.1502$; VIF=1.55; *p<0.05, **p<0.01, ***p<0.001

^{c.}Transition-1 ($r=0.9136$) not included in the model due to correlation with Transition-2. FUH-7 ($r=0.8390$) not included in the model due to correlation with FUH-30. Additionally, encounters that are compliant with the FUH-7 measure are automatically compliant with the FUH-30 measure. Encounters that are compliant with the “Transition-1” measure are automatically compliant with the “Transition-2” measure. Of note, there correlation between FUH-7 and Transition-2 is -0.0289 .

^{d.}Metropolitan: area contains a core urban area of 50,000 or more population, micropolitan: area contains an urban core of at least 10,000 population, or rural: not metropolitan or micropolitan