New York State Department of Health
Division of Quality and Evaluation
Office of Health Insurance Programs

Statistical Brief #5

Hospital Admissions for Ambulatory Sensitive Conditions and Subsequent Potentially Preventable Readmissions in the Medicaid Population in New York State, 2007

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Introduction

Previous work has illustrated that hospital readmissions among the Medicaid population raise questions regarding the quality of inpatient and outpatient care received by recipients and also account for a considerable amount of Medicaid spending [1]. In fact, ongoing analyses have shown that slightly over $651 million Medicaid dollars were spent in 2007 on non-dual eligible recipients for hospital readmissions that were potentially preventable. There is some evidence to indicate, however, that the issue of preventable hospitalizations extends beyond readmissions and may also extend to the hospital admission that preceded those readmissions. Research sponsored by AHRQ has found that approximately 19% of 30 day readmissions follow an initial admission that potentially shouldn't have happened in the first place [2]. If this finding is valid, then not only are many hospital readmissions preventable, but many of the precipitating events that begin the chain of subsequent hospital readmissions are also potentially avoidable.

This report summarizes analyses of hospital admissions for ambulatory sensitive conditions for the non-dually eligible Medicaid recipients (those not eligible for both Medicare and Medicaid) hospitalized population in 2007. The emphasis is not only on how many of these hospitalizations might have been avoided, but also how many of these admissions were followed by clinically related potentially preventable readmissions. The logic and methods employed to define ambulatory sensitive conditions and potentially preventable readmissions are briefly described at the end of this brief.

We focus on admission-readmission chains. The chain begins with an initial admission and is followed by one or more clinically related readmissions that are considered potentially preventable. The term initial admission is used to refer to the first admission that begins an admission-readmission chain. The term readmission refers to any clinically related potentially preventable readmission that occurred after the initial admission.

This brief addresses several questions regarding the hospitalization of New York State Medicaid recipients. How many initial admissions might themselves have been avoidable? How many potentially preventable readmissions actually followed these potentially avoidable initial admissions? How many Medicaid dollars were spent both on the potentially avoidable initial admissions, the readmissions that followed them, and the entire potentially avoidable admission-readmission chain? What particular ambulatory sensitive conditions characterizing the initial admissions resulted in the most frequent readmissions? In addition, any differences between Medicaid fee-for-service (FFS) and managed care inpatient events in terms of these questions are also highlighted.

HIGHLIGHTS

- For all Medicaid initial hospital admissions that were followed by potentially preventable readmissions (PPRs), 14.9% were for an ambulatory sensitive condition and might have been avoided.
- Nearly 5,500 potentially preventable readmissions followed an initial ambulatory sensitive condition admission.
- Approximately two-thirds of these ambulatory sensitive condition initial admissions and subsequent PPRs were associated with fee-for-service (FFS) events.
- In 2007, there were 8,832 avoidable or preventable hospital admissions for the Medicaid population. Approximately 38% of these were for ambulatory sensitive condition admissions that were followed by subsequent readmissions.
- Slightly over $87 million Medicaid dollars were associated with potentially avoidable or preventable hospital admissions in 2007. Slightly under a third of these dollars (32.8%) were associated with ambulatory sensitive condition admissions that were followed by subsequent readmissions.
- The most frequent ambulatory sensitive conditions followed by PPRs were asthma, congestive heart failure, and diabetes.

[1] Statistical Brief #2, Potentially Preventable Hospital Readmissions Among the Medicaid Population in New York State, 2007..
[2] Friedman and Basu, "The Rate and Cost of Hospital Readmissions from Preventable Conditions", Medical Care Research and Review, 2004;61:225-40.

Findings

Potentially Avoidable Initial Admissions

In 2007, 22,583 initial medical and/or surgical hospital admissions were followed by one or more potentially preventable readmissions. Of these initial admissions, 4,685 (20.8%) were themselves potentially avoidable, that is, had an ambulatory sensitive condition primary diagnosis. From these, we selected only those admissions that had a severity of illness, as measured by the APR-DRG[3] severity of illness index (SOI), of minor (SOI=1) or moderate (SOI=2), based on the assumption that hospital admissions with this level of illness severity could have been most appropriately treated in the community instead of the hospital. There were 3,373 such initial admissions that were potentially avoidable (had an ambulatory sensitive condition primary diagnosis and a severity of illness of minor or moderate). Thus, 14.9 per hundred (3,373/22,583 x 100) initial admissions that began a chain of readmissions were themselves potentially avoidable.

Table 1 distinguishes these potentially avoidable initial admissions that began a chain by the FFS and managed care status of the inpatient event. While the total number of potentially avoidable initial admissions was much greater in FFS (67.5% of all avoidable admissions) compared to managed care, the rate of avoidable admissions that began a chain of readmissions was higher in managed care (15.2 per hundred) compared to FFS (14.8 per hundred).

Potentially Preventable Readmissions Following Avoidable Initial Admissions

The 3,373 potentially avoidable admissions were followed by a total of 5,459 readmissions. On average, each potentially avoidable admission was followed by 1.62 readmissions. Each FFS potentially avoidable admission was followed by an average of 1.64 PPRs, while managed care potentially avoidable admissions were followed by an average of 1.57 PPRs.

Table 2 contains the number and percent of these readmissions according to the FFS or managed care status of the inpatient event. Our earlier work suggested that a greater proportion of all readmissions followed from FFS initial admissions than from managed care initial admissions.[1] Table 2 reveals that this remains the case when the initial admission was itself potentially avoidable.

Potentially Avoidable Admission-Readmission Chains

The results in Tables 1 and 2 indicate that potentially avoidable or preventable hospital admissions occur frequently among the Medicaid population and that analyses that focus solely on readmissions may be missing a substantial number of potentially avoidable hospitalizations. Table 3 contains the total number of potentially avoidable or preventable hospital admissions by the FFS or managed care status of the inpatient event.

Table 3 clearly demonstrates that not taking into account avoidable initial admissions leads to underestimates of the total number of potentially avoidable or preventable Medicaid hospital admissions. If the focus was solely on potentially preventable readmissions, and the potentially avoidable initial admissions that preceded these readmissions were ignored, then the total number of potentially avoidable or preventable hospital events would be underestimated by slightly over 38% (3,373 of 8,832 events would be ignored). Estimates of potentially avoidable or preventable hospital events should take into account the entire admission-readmission chain.

Medicaid Dollars and Admission-Readmission Chains

The total Medicaid dollars associated with initial admissions, readmissions, and the entire admission-readmission chain are presented in Table 4. It must be remembered that both the initial admissions and the readmissions are only *potentially* avoidable or preventable and it is unclear how many of them could actually have been avoided or prevented.

Nonetheless, the total dollars represented by these potentially avoidable or preventable hospital events are striking. Slightly over $87 million were spent on events in the entire admission-readmission chain. Consistent with our previous work, the vast majority of these dollars (76.7%) were spent on FFS admission-readmission chains.[1] The most important point, however, is that almost a third of these dollars (32.8%) were spent on potentially avoidable initial admissions, regardless of the FFS managed care status of the event. A focus solely on the readmission portion of the chain would ignore over $28 million associated with potentially avoidable initial admissions.

[3] All patient refined diagnostic related group.

Initial Admission Ambulatory Sensitive Conditions and Subsequent Readmissions

There are thirteen ambulatory sensitive conditions measured by AHRQ's Prevention Quality Indicators (PQIs)[4]. Table 5 presents the number of readmissions that followed each of the ambulatory sensitive conditions present at the potentially avoidable initial admission.
The number of readmissions that followed potentially avoidable initial admissions varies a good deal across the thirteen PQIs. The most frequent conditions present at the initial admission that began a chain of readmissions were asthma (24.2% of all readmissions for any reason followed an initial asthma event), congestive heart failure (18.6% of all readmissions followed an initial congestive heart failure event), and long-term complications for diabetes (11.4% of all readmissions followed an initial diabetes complication event). Taken together, initial hospitalizations for these three ambulatory sensitive conditions were followed by over half (54.2%) of all the readmissions that occurred in 2007. If the number of readmissions following short-term complications for diabetes initial admissions and uncontrolled diabetes were added to the number of readmissions for long term diabetes complications, then the percent of all readmissions following a diabetes precipitating event would increase to 23.3%, and the percent of all readmissions following these three conditions would increase to over 66%. That is, approximately two-thirds of all potentially preventable readmissions followed potentially avoidable initial admissions for asthma, congestive heart failure, or diabetes.

Other ambulatory sensitive conditions that were followed relatively frequently by potentially preventable readmissions were chronic obstructive pulmonary disease (9.3% of all readmissions followed an initial COPD event), and bacterial pneumonia (8.5% of all readmissions followed an initial event with this condition). Such findings might help to focus quality assurance efforts to reduce the number of admissions for ambulatory sensitive conditions, as well as the subsequent readmissions which often follow.

Finally, recall that we limited the severity of illness associated with the ambulatory sensitive conditions at the initial admission to minor or moderate. However, 23.13% of all readmissions that followed one of these ambulatory sensitive condition admissions had a severity of illness of major (20.00%) or extreme (3.13%). This finding suggests that the condition of the patient at readmission after the ambulatory sensitive condition initial admission seems to have deteriorated.

Data Source and Methods

The data upon which these analyses were performed were extracts of Medicaid claims and encounter records contained in New York State's OHIP Data Mart. The full data set contained information for 917,641 inpatient events during 2007, but after events for non-dually eligible recipients were removed, 694,883 events remained for analysis.

This brief used the logic developed by AHRQ to define Prevention Quality Indicators (PQIs)[4], ambulatory sensitive conditions present during the hospital admission which define the admission as potentially avoidable. The data were run through the PQI logic and flags were attached to each record indicating whether or not that inpatient event had a primary diagnosis that could be considered ambulatory sensitive. Each event could flag on any of thirteen PQIs.

The clinical logic that AHRQ employs to define potentially avoidable hospital admissions for adults eliminates all maternal and neonatal admissions (MDCs 14 and 15) and any admissions for patients under 18 years of age. In addition, we excluded all admissions for patients with mental diseases and disorders (MDC 19) or alcohol/drug use and alcohol/drug induced organic mental disorders (MDC 20) from the PQI logic. Our analyses focus solely on initial admissions that could be characterized as either medical or surgical.

Potentially preventable readmissions were defined using the Potentially Preventable Readmission (PPR) software developed by 3M™ that characterizes hospital readmissions as potentially preventable based on their clinical relationship to an initial hospital admission within 30 days (for a fuller discussion of the PPR logic and software, see Statistical Brief #2). Although only medical or surgical initial admissions were counted, no such restriction was applied to those readmissions following the initial admissions.

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[4] For a detailed description of the Prevention Quality Indicators see: http://www.qualityindicators.ahrq.gov/pqi_download.htm

Table 1. Potentially Avoidable At Risk Admissions that Began an Admission-Readmission Chain by Medicaid Payment Category

	Potentially Avoidable Admissions	
	N	%
Fee-for-Service	2,227	67.5
Managed Care	1,096	32.5
All Medicaid	3,373	100.0

Table 2. Potentially Preventable Readmissions Following Avoidable Admissions by Medicaid Payment Category

	PPRs following Avoidable Admissions	
	N	%
Fee-for-Service	3,742	67.5
Managed Care	1,717	32.5
All Medicaid	5,459	100.0

Table 3. Potentially Avoidable or Preventable Hospital Admissions by Medicaid Payment Category

Avoidable or Preventable Hospital Events	Fee-for-Service	Managed Care	All Medicaid
Avoidable Initial Admissions	2,277	1,096	3,373
Preventable Readmissions	3,742	1,717	5,459
Total	6,019	2,813	8,832

Table 4. Medicaid Costs for Potentially Avoidable or Preventable Hospital Admissions by Medicaid Payment Category

Avoidable or Preventable Hospital Events	Fee-for-Service	Managed Care	All Medicaid
Avoidable Initial Admissions	$21,639,144	$6,889,785	$28,528,929
Preventable Readmissions	$45,135,238	$13,384,536	$58,519,774
Total	$66,774,382	$20,274,321	$87,048,703

Table 5. Potentially Preventable Readmissions Following Prevention Quality Indicator-Defined Avoidable Ambulatory Sensitive Conditions

Prevention Quality Indicator	Potentially Preventable Readmissions	
	N[1]	%
Diabetes Short-Term Complications	353	6.4
Perforated Appendix	0	0.0
Diabetes Long-Term Complications	630	11.4
Chronic Obstructive Pulmonary Disease	513	9.3
Hypertension	289	5.2
Congestive Heart Failure	1,024	18.6
Dehydration	156	2.8
Bacterial Pneumonia	466	8.5
Urinary Tract Infection	271	4.9
Angina Without Procedure	96	1.7
Uncontrolled Diabetes	302	5.5
Asthma	1,336	24.2
Lower Extremity Amputation, Diabetes Patients	81	1.5
Total	5,517	100.0

[1] 58 recipients had an initial admission in which they were flagged on two PQIs. Readmissions following these initial admissions for these 58 were counted twice.