Chapter 5: Acute Kidney Injury

Introduction

In recent years, acute kidney injury (AKI) has gained increasing recognition as a major risk factor for the development of chronic kidney disease (CKD). The clearest example of this relationship comes in cases of severe dialysis-requiring AKI where patients fail to recover renal function. Indeed, acute tubular necrosis without recovery is the primary diagnosis for 2 to 3 percent of incident end-stage renal disease (ESRD) cases annually. Yet this represents a small fraction of the renal disease burden resulting from AKI, as studies have demonstrated significantly increased long-term risk of CKD and ESRD following AKI, even after initial recovery of renal function. Furthermore, this relationship is bidirectional and CKD patients are at substantially greater risk of suffering an episode of AKI. As a result, AKI is frequently superimposed on CKD and therefore plays a key role in CKD progression.

In this chapter, we examine antecedents and outcomes associated with AKI using the Medicare five percent sample. As is typical of administrative datasets, Medicare data does not contain clinical or biochemical data with which to identify an AKI episode using consensus criteria based on changes in serum creatinine or urinary output. Instead, episodes of AKI, including those requiring dialysis, are identified based on billing claims alone. An important limitation of this indirect method is poor sensitivity, particularly for less severe cases of AKI. In addition, time trends in AKI incidence must be interpreted with caution due to the possibility of "code creep," whereby non-clinical factors (such as changing billing thresholds or increased awareness/recognition of AKI) increase the likelihood of administrative coding for AKI. Thus, a rising incidence of AKI may represent a true increase in AKI cases or an increased likelihood to code for AKI, or a combination of both factors. In addition, a lower threshold for coding for AKI would lead to identification of less severe episodes and an apparent decrease in the rate of associated adverse outcomes.

As shown in Figure 5.1, the percent of patients with an AKI hospitalization in the Medicare population appears to be rising, now reaching 4 percent annually compared to 1.5 percent a decade ago. Conversely, the proportion of these patients requiring dialysis has declined over the same time frame. Together, these findings suggest that code creep for AKI is indeed occurring: while the threshold for defining (and thus coding for) AKI has decreased over the last 10 years, the threshold for dialysis initiation has likely remained fairly stable.

Unadjusted AKI incidence rates have also been rising. AKI rates are significantly associated with aging, ranging from 20.4 per 1,000 patient years in patients aged 66-69 to 85.2 per 1,000 patient years among patients older than 85 years. Although the temporal rising trend is seen in every age range, the rate of increase appears to be more pronounced with older ages. AKI rates also remain significantly associated with Black/African American race — a disparity rising over the past decade. AKI rates are also higher among patients with diabetes mellitus (DM), pre-existing CKD or both.

Next, we examine outcomes following an AKI hospitalization. An episode of AKI is associated with an increased risk for future episodes of AKI; slightly more than one third of Medicare patients with an AKI hospitalization had another AKI event in the next 24 months. As with first episodes of AKI, Black/African American patients were at higher risk to suffer a recurrent AKI episode than White patients, and recurrent AKI was also more likely in patients with diabetes, CKD or both when compared to those without either comorbidity.

Follow-up medical visits after an initial AKI hospitalization vary by physician specialty. While nearly 75 percent of AKI patients will be seen by a primary care physician within three months of AKI hospitalization, less than 13 percent will have been seen by a nephrologist. This percentage increases over

time, but remains less than 20 percent by one year. Not surprisingly, nephrology visits are more likely in AKI patients with underlying CKD, in whom 28.8 percent are seen by one year. Follow-up serum creatinine testing occurs in the majority of patients, with about 70 percent of patients tested within three months of hospitalization and 85 percent tested by six months.

As noted above, AKI plays an important role in CKD progression, and patients who experienced an AKI hospitalization had modifications in their reported stage of CKD. Nearly 30 percent of individuals without CKD prior to their AKI hospitalization are reclassified as having some degree of CKD in the subsequent year.

Lastly, we explore patient disposition following an AKI hospitalization. Less than half of patients suffering an AKI hospitalization return to their homes, while nearly 30 percent are institutionalized in a skilled nursing facility. These outcomes highlight the significant morbidity associated with AKI.

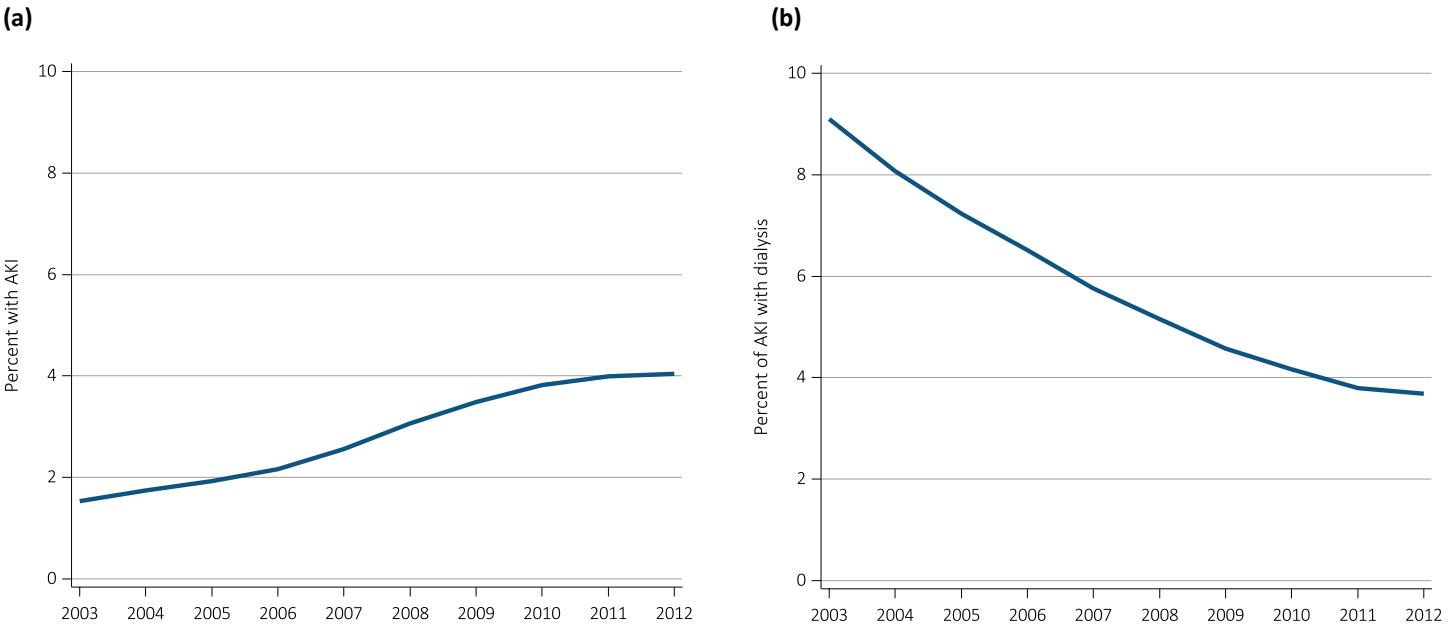
Analytical Methods

For this year's Annual Data Report (ADR), there have been some methodological changes from previous years. First, to define a hospitalization as an AKI hospitalization, the ICD-9-CM (International Classification of Diseases, 9th revision, clinical modification) diagnosis code for AKI must be on the inpatient claim for the hospital stay, even if the patient received dialysis during the stay. This definition of AKI has been validated in published studies (Waikar et al., 2006). In previous ADRs, a hospital stay with dialysis for a person that did not have an ESRD Medical Evidence form (CMS 2728) was considered AKI even if the diagnosis of AKI was not present.

Also in this year's ADR, the analytic sample for the whole chapter contains patients who were alive, did not have ESRD (as indicated by the first service date on the ESRD Medical Evidence form), were not enrolled in a Medicare Advantage plan (Part C/HMO), and had Parts A and B coverage on January 1 of the calendar year. In previous ADRs, the figures corresponding to Figures 5.1-5.3 and Table 5.1 of this year's ADR used a subsample of this main analytic sample consisting of patients who were alive without ESRD or enrollment in a Medicare managed care plan for the entire calendar year. Removing this survival requirement provides a more comprehensive view of AKI in the Medicare population and increases the number of patients with AKI in 2008 from 23,862 to 39,633 and in 2011 from 32,211 to 51,436.

See the *CKD Analytical Methods* chapter for a more detailed explanation of the analytical methods used to generate the figures and table in this chapter.

vol 1 Figure 5.1 Percent of Medicare patients aged 66+, (a) with at least one AKI hospitalization, and (b) with an AKI hospitalization that had dialysis by year, 2003-2012



Data Source: Medicare 5 percent sample. 5.1a: Percent with an AKI hospitalization among all Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on January 1 of year shown. 5.1b: Percent of patients receiving dialysis during their first AKI hospitalization among patients with a first AKI hospitalization. Dialysis is identified by a diagnosis or charge for dialysis on the AKI hospitalization inpatient claim or a physician/supplier (Part B) claim for dialysis during the time period of the AKI inpatient claim. Abbreviation: AKI, acute kidney injury.

Characteristics of Patients With Acute Kidney Injury

Acute kidney injury occurs most commonly in older adults. In the Medicare population, patients aged 80 years and older comprise nearly 55 percent of all patients with an AKI hospitalization as shown in Table 5.1. In 2012, males continue to make up a slight majority of AKI cases, a steady trend observed since 2003. Diabetes mellitus and pre-existing CKD are recognized as two major risk factors for AKI; one or both of these risk factors was present in 56.6 percent of Medicare patients with an AKI hospitalization.

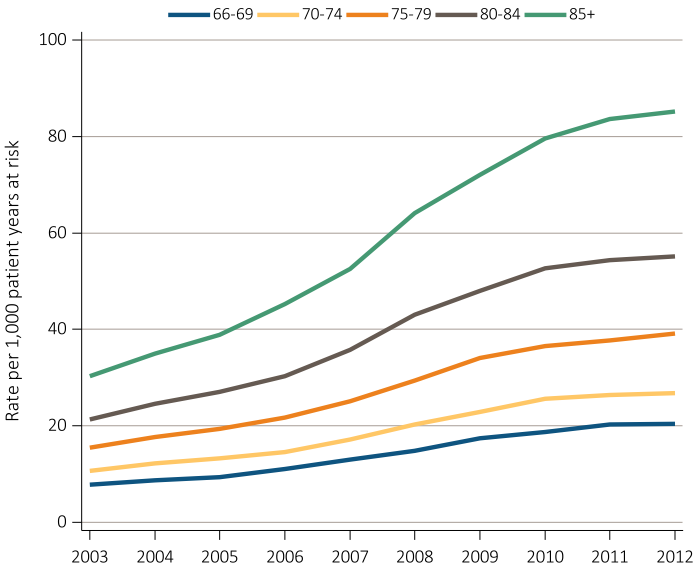
Rates of AKI are strongly influenced by age, as shown in Figure 5.2. Among Medicare patients ages 66-69, for example, the rate of AKI in 2012 was 20.4 per 1,000 patient years, increasing to 26.8, 39.2, 55.1, and 85.2 respectively, for ages 70-74, 75-79, 80-84, and 85 and older. Rates of AKI have risen over time across all age ranges.

vol 1 **Table 5.1 Characteristics of Medicare patients aged 66+ with at least one AKI hospitalization: age, sex, race, CKD, DM by year, 2003-2012**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Age										
66-69	10.6	10.5	10.3	10.6	10.6	10.3	10.9	10.8	11.3	11.3
70-74	16.5	16.3	16.0	15.3	15.4	15.5	15.4	15.6	15.6	15.8
75-79	21.8	21.3	21.0	20.2	19.4	18.5	18.6	18.0	17.7	18.0
80-84	22.5	22.9	22.9	22.3	22.4	22.4	21.5	21.3	20.7	19.9
85+	28.6	29.0	29.9	31.6	32.1	33.4	33.7	34.3	34.7	34.9
Sex										
Female	47.9	48.0	47.7	48.1	47.8	47.8	47.8	47.5	47.7	48.2
Male	52.1	52.0	52.3	51.9	52.2	52.2	52.2	52.5	52.3	51.9
Race										
White	82.9	82.6	81.7	82.0	82.8	83.2	83.2	83.1	83.1	82.7
Black/African American	12.7	13.0	13.7	13.5	12.5	12.0	12.0	12.1	12.0	12.2
Native Am	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Asian	1.0	1.3	1.2	1.2	1.2	1.4	1.4	1.4	1.5	1.5
Other	3.0	2.9	3.1	2.9	3.0	3.0	3.0	3.0	2.9	3.1
Pre-existing comorbidities										
No DM or CKD prior year	55.0	53.3	52.2	51.2	49.4	48.2	47.2	46.0	44.5	43.4
DM no CKD prior year	24.6	25.2	25.1	25.1	23.1	23.0	22.5	22.5	22.0	21.1
CKD no DM prior year	8.8	9.5	9.5	10.0	12.1	12.8	13.5	13.9	14.8	15.3
Both CKD & DM prior year	11.7	12.0	13.2	13.7	15.4	16.0	16.8	17.7	18.7	20.2

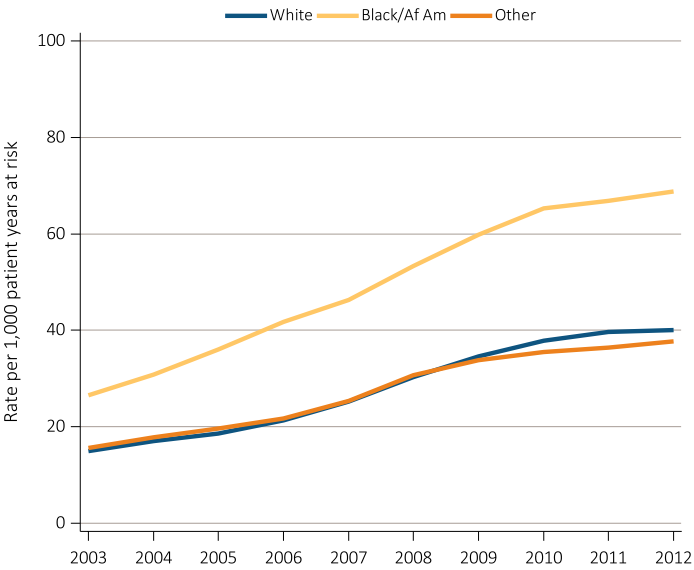
Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on January 1 of year shown. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

vol 1 Figure 5.2 Unadjusted rates of first hospitalization with AKI for Medicare patients aged 66+ by age and year, 2003-2012



Data Source: Medicare 5 percent sample. Age as of January 1 of specified year. All patient-years at risk for Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on January 1 of year shown. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Abbreviation: AKI, acute kidney injury.

vol 1 Figure 5.3 Unadjusted rates of first hospitalization with AKI for Medicare patients aged 66+ by race and year, 2003-2012

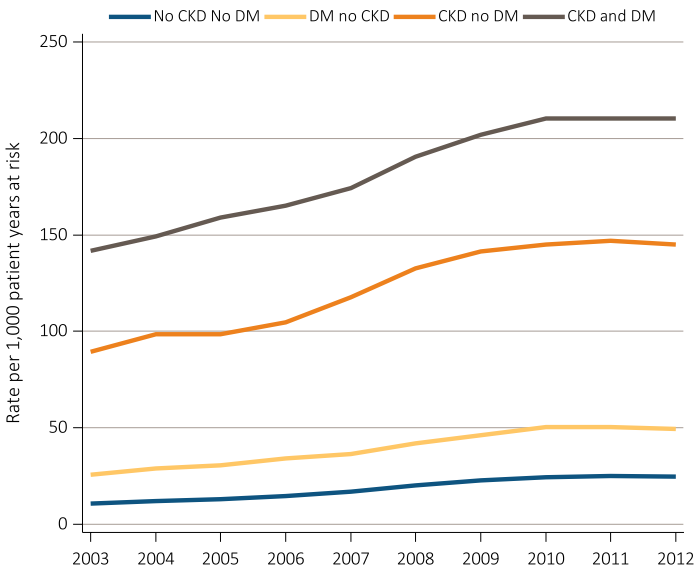


Data Source: Medicare 5 percent sample. All patient-years at risk for Medicare patients aged 66 or older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on January 1 of year shown. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Abbreviations: Af Am, African American; AKI, acute kidney injury.

Rates of AKI in Medicare patients age 66 and older vary considerably by race, as shown in Figure 5.3. In 2012, the incidence rate reached 68.8 per 1,000 patient years at risk in Blacks/African Americans compared to 40.1 and 37.7, respectively, in Whites and individuals of other races. While this relationship has been observed since 2003, the gap has steadily widened reflecting a higher rate of increase in Blacks/African Americans.

The incidence rates for AKI, shown in Figure 5.4, also vary substantially by underlying comorbidity. In 2012, Medicare patients with DM and no known CKD had an AKI incidence rate of 49.5 per 1,000 patient years compared to 24.8 per 1,000 patient years in non-diabetic, non-CKD patients. Non-diabetic patients with CKD experienced an AKI incidence rate of 145.0 per 1,000 patient years, while the rate in patients with both diabetes and CKD was 210.3 per 1,000 patient years.

vol 1 Figure 5.4 Unadjusted rates of first hospitalization with AKI for Medicare patients aged 66+ by CKD, DM, and year, 2003-2012

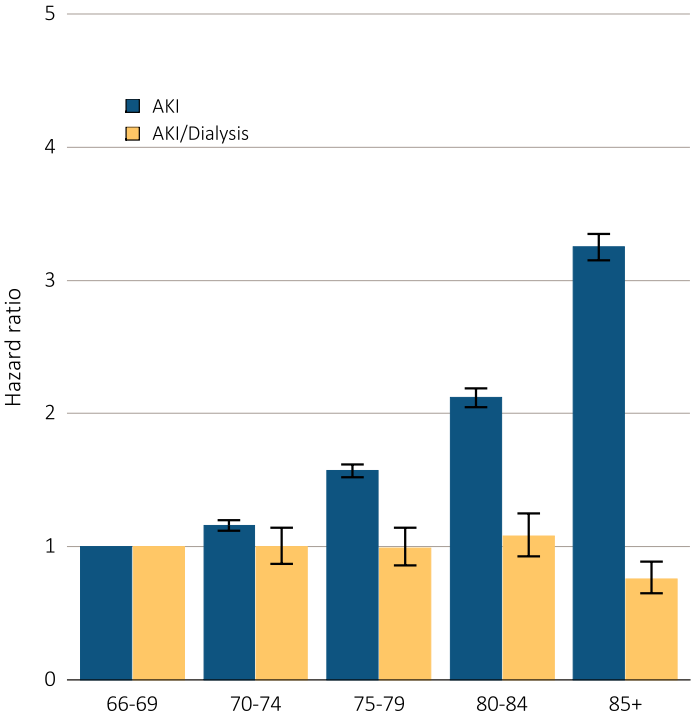


Data Source: Medicare 5 percent sample. All patient-years at risk for Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on January 1 of year shown. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

Hospitalization for Acute Kidney Injury

As indicated in Figure 5.5, the adjusted hazard for an AKI hospitalization is highly associated with age and increases in a graded manner with increasing age group. There is no trend by age in the hazard of dialysis-associated AKI hospitalization. Since dialysis is a treatment choice of physicians and patients, the relationship with age is more complicated, perhaps reflecting different thresholds to initiate dialysis in patients in the oldest age groups.

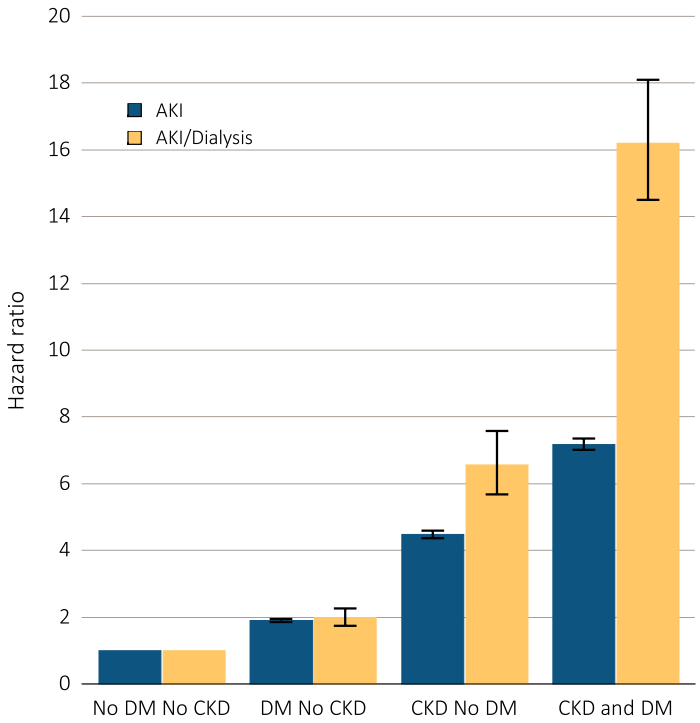
vol 1 Figure 5.5 Adjusted hazard of a first AKI hospitalization in Medicare patients aged 66+, overall and dialysis-requiring, by age, 2012



Data Source: Medicare 5 percent sample. Medicare patients aged 66 or older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on 1/1/2012. Dialysis is identified by a diagnosis or charge for dialysis on the AKI inpatient claim or a physician/supplier (Part B) claim for dialysis during the time period of the AKI inpatient claim. Models each include age, race, sex, DM and CKD status in prior year. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Error bars represent 95% confidence interval of estimates. Abbreviation: AKI, acute kidney injury.

As shown in Figure 5.6, when examining baseline conditions, it is apparent that DM and CKD influence AKI risk both independently and synergistically. Compared to patients with neither comorbidity, patients with both DM and CKD had an adjusted hazard ratio of 7.18 for an episode of AKI. Having either DM or CKD alone conferred a hazard ratio of 1.90 and 4.48 respectively. The hazard ratios were even more pronounced for AKI requiring dialysis.

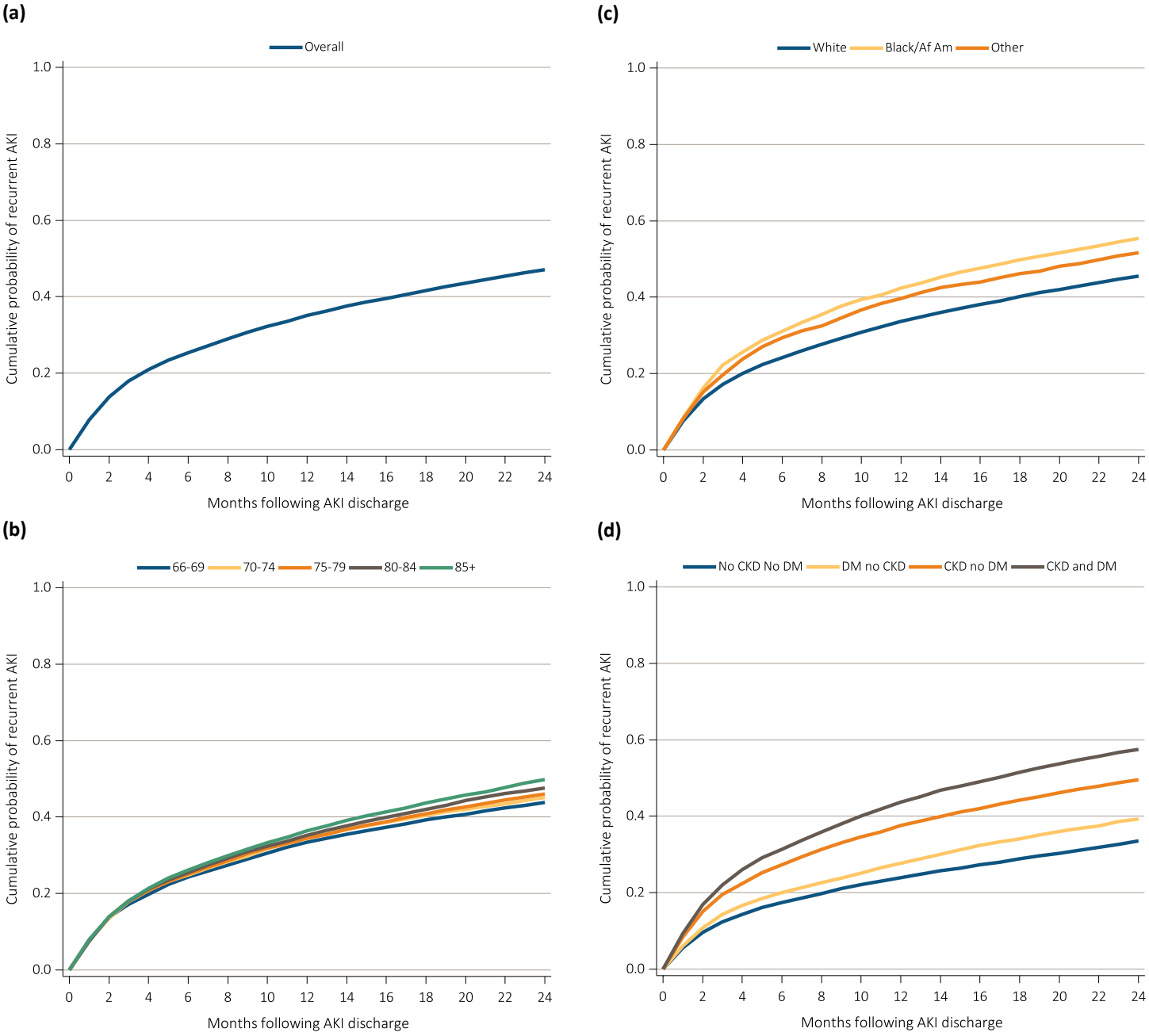
vol 1 Figure 5.6 Adjusted hazard of an AKI hospitalization in Medicare patients by DM & CKD status, 2012



Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were alive on 1/1/2012. Dialysis is identified by a diagnosis or charge for dialysis on the AKI inpatient claim or a physician/supplier (Part B) claim for dialysis during the time period of the AKI inpatient claim. Models each include age, race, sex, DM and CKD status in prior year. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Error bars represent 95% confidence interval of estimates. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

Following an AKI hospitalization, the overall probability of a recurrent AKI event is 0.35 in the next 12 months and 0.47 by 24 months, as shown in Figure 5.7a. In contrast to first episodes, the rate of recurrent AKI is relatively similar across age groups in the Medicare population (5.7b); however, interpretation of this finding is limited by the effects of death censoring, which will be higher in older age groups. Blacks/African Americans are more likely to have a recurrent AKI hospitalization than other races, with a probability of 0.55 at 24 months (5.7c). Similarly, having either DM or CKD is associated with an increased probability for recurrent AKI compared to having neither (5.7d). The highest probability for recurrent AKI is seen in patients with both diabetes and CKD, in whom the probability reaches 0.58 by 24 months.

vol 1 Figure 5.7 Cumulative probability of a recurrent AKI hospitalization within two years of live discharge from first AKI hospitalization in 2010 for Medicare patients aged 66+, (a) overall, (b) by age, (c) by race, and (d) by CKD and DM

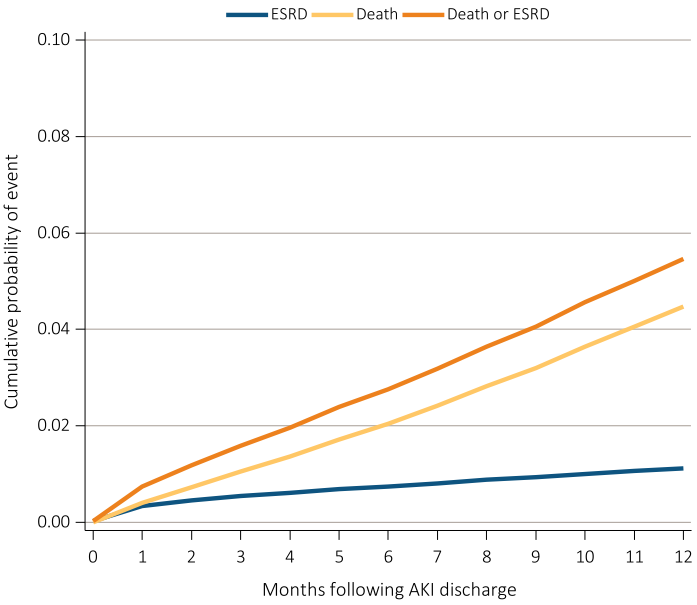


Data Source: Medicare 5 percent sample. Age on January 1, 2010. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form on 1/1/2010 and were discharged alive from an AKI hospitalization in 2010. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

Patient Care and Outcomes

Figure 5.8 shows that among survivors of an AKI hospitalization, the overall probability of developing ESRD in the following year is slightly higher than 2 percent in the Medicare population aged 66 and older. In this same time frame, the probability of death is nearly 43 percent.

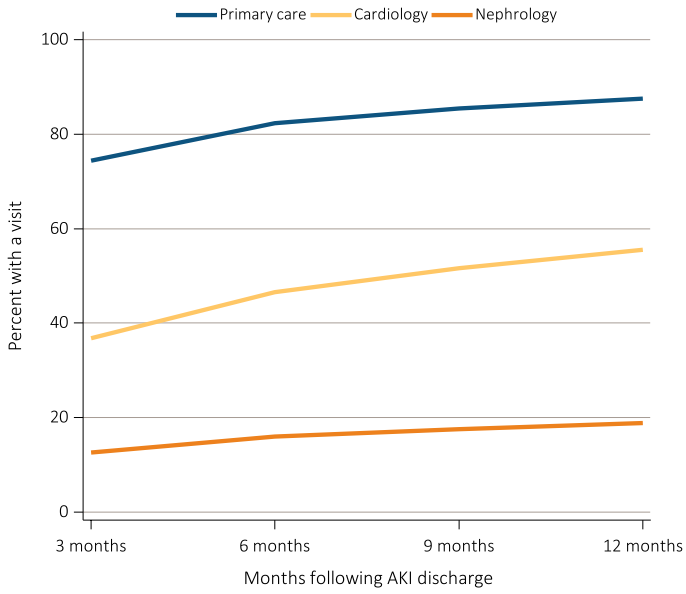
vol 1 Figure 5.8 Cumulative probability of death-censored ESRD, death, and the composite of death or ESRD within one year of live discharge from first AKI hospitalization occurring in 2010-2011 for Medicare patients aged 66+



Data Source: Medicare 5 percent sample. Medicare patients aged 66 or older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form, and were discharged alive from a first AKI hospitalization in 2010 or 2011. All models censored at the end of Medicare Parts A & B participation, switch to Medicare Advantage program, or 365 days after AKI discharge. Model for ESRD also is censored at death. Model for death is not censored at the start of ESRD. Abbreviations: AKI, acute kidney injury by diagnosis code; ESRD, end-stage renal disease.

Following an initial AKI hospitalization, 74.4 percent of patients see a primary physician within three months of discharge, while 36.8 and 12.7 percent, respectively, see a cardiologist or nephrologist, as illustrated in Figure 5.9. Follow-up increases with time, but the percent of patients seen by a nephrologist at 12 months following an AKI hospitalization remained only 18.8 percent.

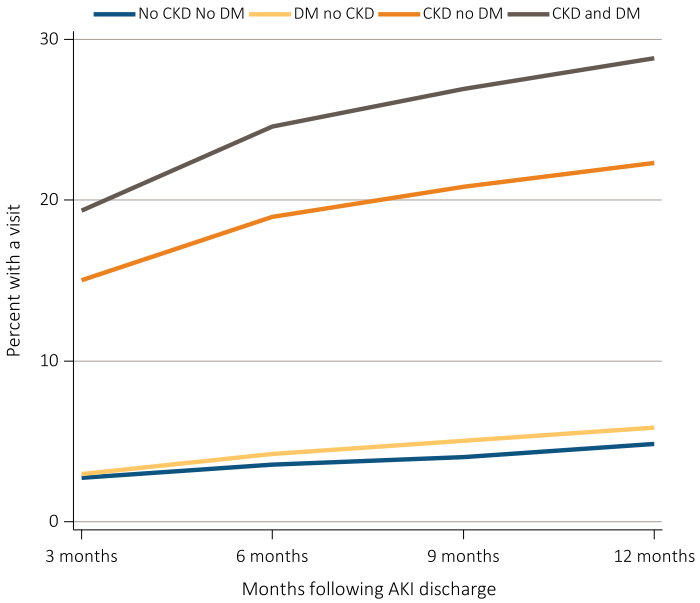
vol 1 Figure 5.9 Outpatient physician visits within one year of live discharge from first AKI hospitalization in 2011 for Medicare patients aged 66+ by physician specialty and time



Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form on 1/1/2011, and were discharged alive from a first AKI hospitalization in 2011. For each time point, the denominator is all patients alive, without ESRD, not in a Medicare Advantage plan and with Medicare Parts A & B. Physician visits are from physician/supplier claims with provider specialty codes for primary care (01, 08-family practice, 11-internal medicine), cardiology (06), and nephrology (39) and claim source indicating an outpatient setting. Abbreviation: AKI, acute kidney injury.

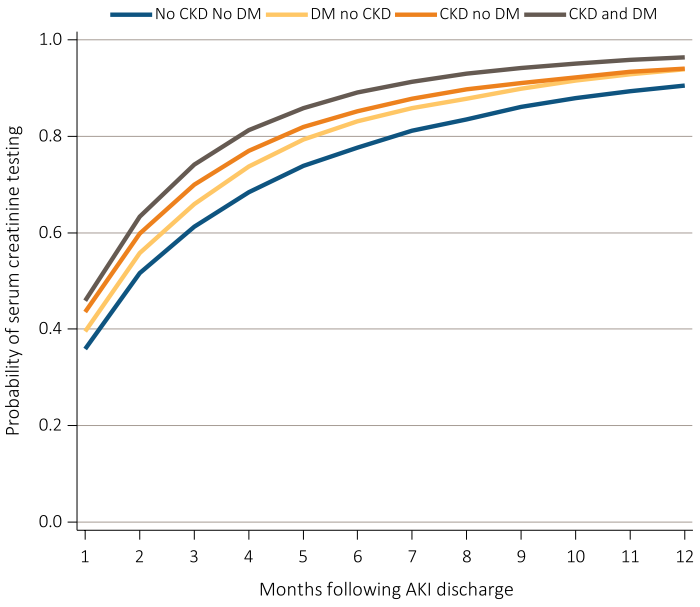
Figure 5.10 shows that compared to the overall AKI cohort, patients with AKI superimposed on CKD were more likely to have a nephrologist visit following an AKI hospitalization. At three months, 15.0 percent of AKI on CKD patients had seen a nephrologist, and this rose to nearly 22.3 percent by 12 months. In contrast, just 4.9 percent of AKI patients without either diabetes or CKD were seen by a nephrologist by 12 months following AKI hospitalization.

vol 1 Figure 5.10 Outpatient nephrology visits within one year of live discharge from first AKI hospitalization in 2011 for Medicare patients aged 66+ by CKD, DM, and time



Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form on 1/1/2011, and were discharged alive from a first AKI hospitalization in 2011. For each time point, the denominator is all patients alive, without ESRD, not in a Medicare Advantage plan and with Medicare Parts A & B. Physician visits are from physician/supplier claims with provider specialty codes for nephrology (39) and claim source indicating an outpatient setting. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

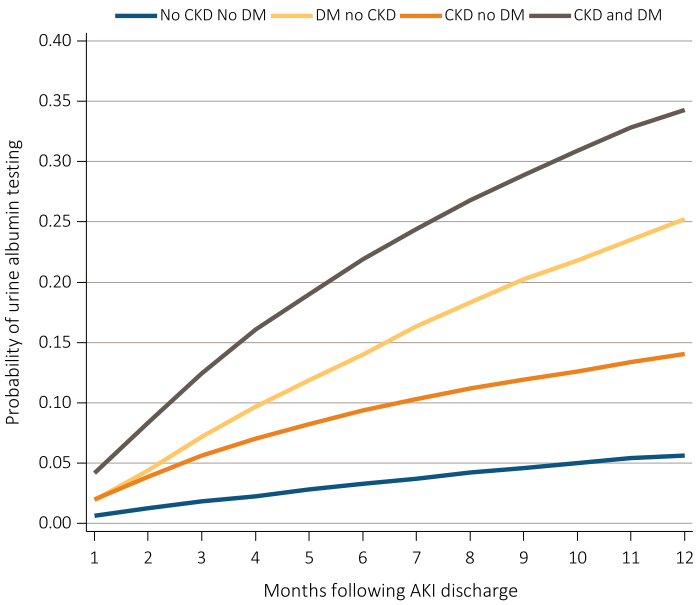
vol 1 Figure 5.11 Cumulative probability of a claim for a serum creatinine test within one year of live discharge from first AKI hospitalization in 2011 for Medicare patients aged 66+ by CKD, DM, and time



Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form on 1/1/2011, and were discharged alive from a first AKI hospitalization in 2011. Date of first serum creatinine test following AKI discharge is from inpatient and outpatient claims with healthcare common procedure coding system (HCPCS) codes of 80048, 80050, 80053, 80069, or 82565. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

Among individuals suffering an in-hospital AKI event, the probability of serum creatinine and urine albumin testing increased with time following index hospitalization discharge, as shown in Figures 5.11 and 5.12. While 85 percent of AKI patients had a follow-up creatinine by 6 months after hospitalization, only 13 percent of patients had urine albumin testing by this point. Rates of serum creatinine testing were relatively similar regardless of diabetes or CKD status. However, compared to patients without these comorbidities, the probability of urine albumin testing was higher in patients with CKD (14 percent by 12 months), diabetes (25 percent by 12 months), or both (34 percent by 12 months).

vol 1 Figure 5.12 Cumulative probability of a claim for an urine albumin test within one year of live discharge from first AKI hospitalization in 2011 for Medicare patients aged 66+ by CKD, DM, and time



Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A and B, no Medicare Advantage plan (Part C/HMO), no ESRD by first service date from Medical Evidence form on 1/1/2011, and were discharged alive from a first AKI hospitalization in 2011. Date of first urine albumin test following AKI discharge is from inpatient and outpatient claims with healthcare common procedure coding system (HCPCS) codes of 82042, 82043, 82044, or 84156. Censored at death, ESRD, end of Medicare Parts A & B participation, or switch to Medicare Advantage program. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; DM, diabetes mellitus.

Changes in CKD Status After Acute Kidney Injury

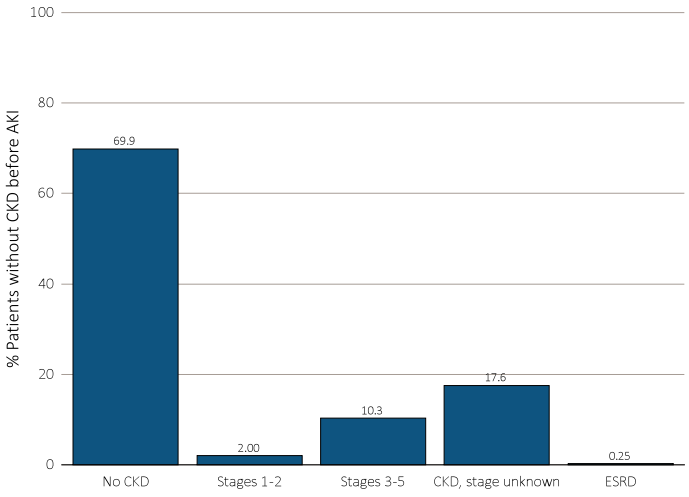
CKD status changes significantly in the year following an AKI hospitalization, as shown in Figure 5.13. Among patients without baseline CKD, nearly 30 percent are reclassified as having some degree of CKD, including 0.25 percent being declared ESRD.

Table A. ICD-9-CM Codes

585.1	Chronic kidney disease, Stage 1
585.2	Chronic kidney disease, Stage 2 (mild)
585.3	Chronic kidney disease, Stage 3 (moderate)
585.4	Chronic kidney disease, Stage 4 (severe)
585.5	Chronic kidney disease, Stage 5 (excludes 585.6: Stage 5, requiring chronic dialysis[a])

CKD unspecified identified by multiple codes including 585.9, 250.4x, 403.9xm & others. CKD stage estimates are from a single measurement. For clinical case definition, abnormalities should be present ≥ 3 months.
[a] In USRDS analyses, patients with ICD-9-CM code 585.6 & with no ESRD 2728 form or other indication of end-stage renal disease (ESRD) are considered to have code 585.5. See the CKD Analytical Methods chapter for details.

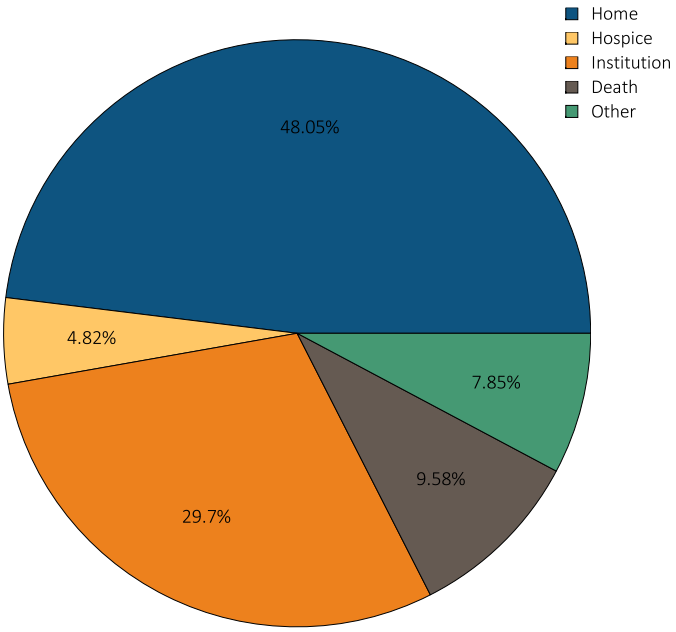
Figure 5.13 Renal status one year following discharge from AKI hospitalization in 2010-2011, among surviving Medicare patients aged 66+ without kidney disease prior to AKI hospitalization, by CKD stage and ESRD status



Data Source: Medicare 5 percent sample. Medicare patients aged 66 and older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), did not have ESRD, were discharged alive from a first AKI hospitalization in 2010 or 2011, and did not have any claims with a diagnosis of CKD in the 365 days prior to the AKI. Renal status after AKI determined from claims between discharge from AKI hospitalization and 365 days after discharge. Stage determined by 585.x claim closest to 365 days after discharge; ESRD by first service date on Medical Evidence form. Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease.

In Figure 5.14, we examine the status and disposition for AKI patients once they are discharged from the hospital. Among AKI patients age 66 and older in 2012, fewer than 50 percent were discharged to their home. Mortality (including discharge to hospice) was 14.4 percent, while 29.7 percent of patients discharged to institutions including short-term skilled nursing facility stays, rehabilitation hospitals or long-term care facilities.

vol 1 **Figure 5.14 Hospital discharge status of first AKI hospitalization for Medicare patients aged 66+, 2012**



Data Source: Medicare 5 percent sample. Medicare patients aged 66 or older who had both Medicare Parts A & B, no Medicare Advantage plan (Part C/HMO), did not have ESRD on 1/1/2012 and had a first AKI hospitalization in 2012. Institution includes short-term skilled nursing facilities, rehabilitation hospitals, and long-term care facilities. Home also includes patients receiving home health care services. Excludes patients admitted to the acute care hospital from a skilled nursing facility. Abbreviation: AKI, acute kidney injury.

References

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