Poster #169

Trends in ESRD Prospective Payment System (PPS) Case-Mix Prevalence in the Medicare Fee-for-Service (FFS) Population 2000–2008

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INTRODUCTION

- The ESRD PPS as implemented in 2011 used patient case-mix from the 2006–08 Medicare fee-for-service population to set weights for each patient-level case-mix adjuster in the payment formula. The prevalence of each case-mix adjuster used was not made public, and little is known about case-mix trends over time, before or since the period used to set the PPS case-mix weights.

OBJECTIVE

- The objective was to analyze changes in patient-level case-mix adjuster prevalence in the Medicare FFS population in the years leading up to the PPS implementation (2000–2008).

METHODS

- Data Source and Study Cohort. United States Renal Data System (USRDS)[1] claims and eligibility data from 2000–2008 were used to calculate prevalence of each PPS patient-level case-mix adjuster for all Medicare FFS patients age 18+ who were on dialysis during the 9-year study period. Patients were counted only for those calendar months in which the patient was on dialysis and covered by Medicare for more than half of the month. Data were split into 3-year cohorts: 2000–2002, 2003–2005, and 2006–2008. The number of patients and number of patient-months in each 3 year cohort are shown below:

  2000–2002: Patients = 408,208 Patient months = 7,626,998

  2003–2005: Patients = 454,965 Patient months = 8,679,756

  2006–2008: Patients = 481,134 Patient months = 9,362,698

- Patient-level Case-mix Adjusters. Case-mix adjuster definitions replicated the PPS reimbursement definitions as closely as possible.
  - Age: Age was defined at first date of ESRD only. Age was grouped into PPS age cohorts (18–44, 45–59, 60–69, 70–79, 80+).
  - Body surface area (BSA): BSA was calculated from height and weight measured at the time of first ESRD only. $BSA = 0.007184 * height^{0.725} * weight^{0.425}$
  - Body mass index (BMI): recorded at the time of first date of ESRD only. BMI was grouped as <18.5 vs. ≥18.5.
  - New to dialysis: For each month in which a patient was receiving dialysis and covered by Medicare, we indicated whether it occurred within the first 4 months of the calendar month in which dialysis was first received for at least half of the month.

METHODS (Continued)

  - Acute and chronic conditions: We determined acute and chronic conditions from ICD-9-CM codes in Medicare claims. For acute conditions, once a claim was found, a patient was considered to have the acute condition for that month and 3 subsequent months. Any claim within these 4 months was considered to be part of the same acute episode. For chronic conditions, once a claim was found, a patient was considered to have the condition for that and all subsequent months.
- Analysis. The percentage of all patients and of all patient months within each 3-year cohort was calculated for each case-mix adjuster. Percent change in case-mix adjuster prevalence was then calculated between 3-year cohorts.
- Validation. To validate the study results, we calculated the average PPS patient payment multiplier using the 2006–08 prevalence estimates and compared this result with the mean patient payment multiplier published in the 2011 PPS Final Rule.[2]

RESULTS

- Table 1 shows the prevalence of each patient-level case-mix adjuster in each of the three 3-year cohorts. The average patient payment multiplier using the 2006–08 prevalence estimates from this study was 1.072, compared to the 1.063 mean multiplier reported in the 2011 Final Rule.

Table 1: Patient-level Case-Mix Adjuster Prevalence by 3-Year Cohort

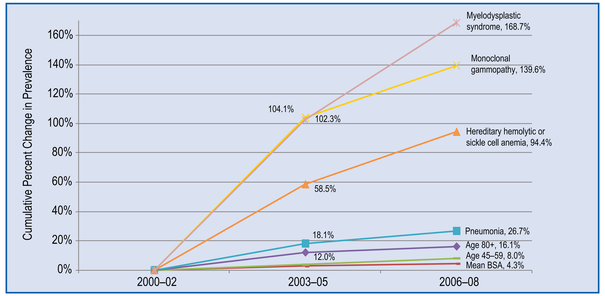
Patient-level Case-Mix Adjuster Category		Percent of Patient Months		
		2000–02	2003–05	2006–08
Age:	18–44	14.6%	13.4%	12.8%
	45–59	25.7%	26.6%	27.7%
	60–69	23.3%	23.5%	24.0%
	70–79	25.3%	24.1%	22.6%
	80 +	11.1%	12.4%	12.9%
Underweight (BMI < 18.5)		5.2%	4.2%	3.5%
Duration of renal replacement therapy < 4 months		7.5%	7.2%	6.5%
Monoclonal gammopathy		0.6%	1.3%	1.5%
Hereditary hemolytic or sickle cell anemia		0.3%	0.4%	0.5%
Myelodysplastic syndrome		0.5%	1.1%	1.4%
Pericarditis		0.5%	0.4%	0.4%
Gastrointestinal bleeding		1.2%	1.3%	1.1%
Bacterial Pneumonia		1.4%	1.7%	1.8%
Mean BSA		1.811	1.858	1.889

- Large percentage changes were observed in the prevalence of many case-mix categories between 2000–02 and 2006–08.

RESULTS (Continued)

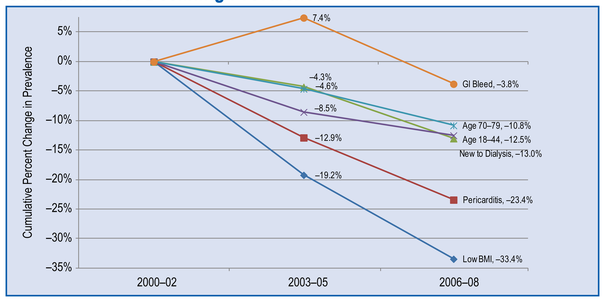
- Large increases were observed in all chronic comorbidities [myelodysplastic syndrome (+169%), monoclonal gammopathy (+140%), hemolytic and sickle cell anemias (+94.4%)] as well as in prevalence of bacterial pneumonia (+26.7%) and patients aged 80+ (+16.1%). (Figure 1).

Figure 1. Cumulative Percent Change in Case-Mix Adjuster Prevalence 2000–02 to 2006–08 in the Medicare FFS Population. Conditions with Rising Prevalence



- Large declines were observed in prevalence of Low BMI patients (–33.4%), prevalence of pericarditis (–23.4%), patients in the first 4 months of dialysis (–13.0%), and patients aged 18-44 (–12.5%). (Figure 2).

Figure 2. Cumulative Percent Change in Case-Mix Adjuster Prevalence 2000–02 to 2006–08 in the Medicare FFS Population. Conditions with Declining Prevalence



DISCUSSION

- There were large changes in patient-level case-mix adjuster prevalence in the Medicare ESRD population between 2000–02 and 2006–08. Important demographic changes included: new dialysis patients as percent of total declined, fewer patients in the high adjuster age cohort 18–44, and increasing prevalence of chronic comorbidities.
- Such changes in case-mix prevalence have implications for payment, should the observed trends have continued post-2008. For instance, lower prevalence of patient categories with high payment adjusters may result in lower than expected payments program-wide.

LIMITATIONS

- This was a population analysis. The effect of changes in the patient mix between 3-year cohorts on changes in case-mix adjuster prevalence were not examined.
- The study period ended with 2008 data. Further changes between 2008 and the implementation date of the PPS (2011) were not determined.
- Due to data limitations, there were some slight methodological differences in case-mix prevalence calculations in this study from how Medicare calculated case-mix. This may account for the slight difference in average patient payment multiplier estimated by this study as compared to the computation published by Medicare.

CONCLUSION

- The observed changes in case-mix prevalence over time suggest that the PPS payment formula should be regularly updated to reflect current case-mix. To improve transparency in the rate-setting process, Medicare should consider publishing the prevalence of each case-mix adjuster used in setting payment rates.

REFERENCES

1. USRDS Standard Analytical Files (SAFs). www.usrds.org.
2. 42 CFR Parts 410, 413, and 414; medicare program; end-stage renal disease prospective payment system; final rule regulation number CMS-1418-F.

ACKNOWLEDGMENTS

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