Dialysis Facility-Level Transfusion Rates Can Be Unreliable Due to Variability in Hospital-Level Billing Patterns for Blood

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Introduction

- The standardized transfusion ratio (STrR) is currently reported by Dialysis Facility Compare (DFC) and will become part of the End-Stage Renal Disease (ESRD) Quality Incentive Program (QIP) for performance year 2016.
- Transfusions are ascertained from Medicare Parts A and B claims.
  - The large majority of transfusions are ascertained from Part A claims for inpatient care.
- The validity of STrR estimation depends crucially on accurate identification of transfusion during hospitalization.
- Claims for hospitalization may include:
  - *International Classification of Diseases, 9th Edition, Clinical Modification* (ICD-9-CM) procedure code(s) for "transfusion of blood and blood components"
  - Medicare revenue center code(s) for "blood" and "blood storage and processing"
  - Medicare value code for "pints of blood furnished," which may be recorded for the purpose of collecting the blood deductible
- Not all codes specify the blood product that was transfused or even whether transfusion actually occurred.
- We aimed to describe variability of billing patterns for blood among hospitalized dialysis patients.

Methods

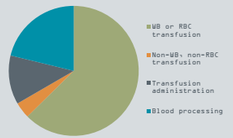
- Medicare beneficiaries undergoing chronic dialysis in either 2011 or 2012 were identified from the Centers for Medicare & Medicaid Services (CMS) Standard Analytical Files (SAFs).
- Among such patients, we queried Part A claims for short-term hospital admissions and retained each admission with billing for blood (ABB), as marked by the following codes:
  - ICD-9-CM procedure code 99.0x
  - Medicare revenue center code 038x
  - Medicare revenue center code 039x
  - Medicare value code 37
- With a sequential classification algorithm, we categorized each ABB into one of 4 mutually exclusive categories:
  - [1] Whole blood (WB) or red blood cell (RBC) transfusion
    - Procedure code 99.03 or 99.04
    - (Revenue center 0381 or 0382) and (Revenue center 0391)
    - Value code 37
  - [2] Non-WB, non-RBC transfusion
  - [3] Transfusion administration, without explicit coding of blood components transfused
  - [4] Blood processing alone, without explicit coding of whether transfusion occurred
- We assessed variation in the distribution of ABB categories by states and hospitals.

Results

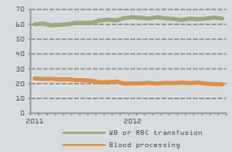
- We identified 307,174 ABB between January 1, 2011, and December 31, 2012.
- Nearly 63% of ABB indicated WB or RBC transfusion, 4% indicated transfusion of other blood components, and more than 12% indicated transfusion of unspecified components.
- Over 21% of ABB included no code that explicitly indicated the occurrence of transfusion.
- Monthly percentages of ABB with codes for blood processing alone declined modestly during the study era.
- In states (n = 39) with > 1000 ABB:
  - Percentages of ABB with either WB or RBC transfusion ranged from 47% (Pennsylvania) to 80% (Nebraska).
  - Percentages of ABB with codes for blood processing alone ranged from 7% (Mississippi) to 53% (Hawaii).
- We identified 2,756 hospitals with ABB in Medicare beneficiaries undergoing dialysis.
  - There were 1,014 (37%) hospitals with > 100 ABB, collectively representing 80% of all aforementioned ABB.
- In hospitals (n = 1,014) with > 100 ABB:
  - The 10th and 90th percentiles of the percentages of ABB with either WB or RBC transfusion were 2% and 89%, respectively.
  - Corresponding percentiles of the share of ABB with codes for blood processing alone were 0% and 65%.

Distribution of ABB categories

Among Medicare beneficiaries undergoing chronic dialysis, 2011-2012

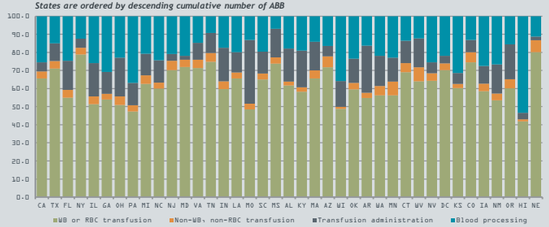


Secular trends in shares of ABB with WB or RBC transfusion and of ABB with blood processing



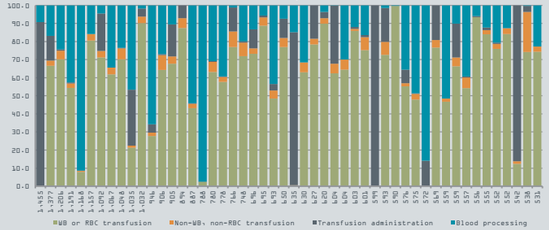
Distribution of ABB Categories in States with > 1000 ABB

States are ordered by descending cumulative number of ABB



Distribution of ABB Categories in 50 Hospitals with Highest Counts of ABB

Labels on the horizontal axis indicate the cumulative number of ABB at the hospital



Conclusions

- The incidence of whole blood or red blood cell transfusion among hospitalized dialysis patients is uncertain, on the basis of data ascertained from Medicare claims.
- Uncertainty is primarily due to frequent coding of blood processing without evidence of transfusion.
- Between-hospital variability in billing patterns for blood was substantial.
- Sensitive definitions of whole blood or red blood cell transfusion may overstate the incidence of such transfusion.
- Specific definitions of whole blood or red blood cell transfusion will understate the incidence of such transfusion in dialysis facility populations that reside near hospitals that use non-specific coding.
  - Use of specific definitions will induce differential misclassification according to location, resulting in biased estimation of STrR.
- To improve the face validity of STrR, CMS should require hospitals to document transfusion in a consistent manner.
- In the absence of such a mandate, multicenter validation studies of hospital billing for blood are needed.
- Even without validation studies, methods for estimation of STrR should exclude the occurrence of non-whole blood, non-red blood cell transfusion (*e.g.*, plasma transfusion).