

Measure Information Form

Project Title:

End-Stage Renal Disease Access to Kidney Transplantation Measure Development

Project Overview:

The Centers for Medicare & Medicaid Services (CMS) has contracted with the University of Michigan's Kidney Epidemiology and Cost Center (UM-KECC) to develop access to kidney transplantation measures for ESRD patients. The contract name is the ESRD Quality Measure Development, Maintenance, and Support contract. The contract number is HHSM-500-2013-13017I.

Date:

Information included is current on December 21, 2015.

Measure Name

Percentage of Prevalent Patients Waitlisted (PPPW)

Descriptive Information

Measure Name (Measure Title De.2.)

Percentage of Prevalent Patients Waitlisted (PPPW)

Measure Type De.1.

Process

Brief Description of Measure De.3.

This measure tracks the percentage of patients at each dialysis facility who were on the kidney or kidney-pancreas transplant waitlist. Results are averaged across patients prevalent on the last day of each month during the reporting year.

If Paired or Grouped De.4.

N/A

Subject/Topic Areas De.5.

Renal: End Stage Renal Disease (ESRD)

Renal: Renal

Crosscutting Areas De 6.

Care Coordination: Care Coordination

Disparities

Access

Measure Specifications

Measure-specific Web Page S.1.

TBD

If This Is an eMeasure S.2a.

N/A

Data Dictionary, Code Table, or Value Sets S.2b.

See Appendix A

For Endorsement Maintenance S.3.

N/A

Numerator Statement S.4.

Number of patient months in which the patient at the dialysis facility is on the kidney or kidney-pancreas transplant waitlist as of the last day of each month during the reporting year.

Time Period for Data S.5.

One year

Numerator Details S.6.

To be included in the numerator for a particular month, the patient must be on the kidney or kidney-pancreas transplant waitlist as of the last day of the month during the reporting year.

Denominator Statement S.7.

All patient-months for patients who are under the age of 75 on the last day of each month and who are assigned to the dialysis facility according to each patient's treatment history as of the last day of each month during the reporting year.

Target Population Category S.8.

Populations at risk: Populations at risk

Denominator Details S.9.

A treatment history file is the data source for the denominator calculation used for the analyses supporting this submission. This file provides a complete history of the status, location, and dialysis treatment modality of an ESRD patient from the date of the first ESRD service until the patient dies or the data collection cutoff date is reached. For each patient, a new record is created each time he/she changes facility or treatment modality. Each record represents a time period associated with a specific modality and dialysis facility.

CROWNWeb is the primary basis for placing patients at dialysis facilities and dialysis claims are used as an additional source. Information regarding first ESRD service date, death, and transplant is obtained from CROWNWeb (including the CMS Medical Evidence Form (Form CMS-2728) and the Death Notification Form (Form CMS-2746)) and Medicare claims, as well as the Organ Procurement and Transplant Network (OPTN) and the Social Security Death Master File.

The model is currently age-adjusted, with age updated each month.

Denominator Exclusions (NQF Includes "Exceptions" in the "Exclusion" Field) S.10.

Exclusions that are implicit in the denominator include:

- Patients 75 years of age and older on the last day of each month during the reporting year.

In addition, patients who were admitted to a skilled nursing facility (SNF) during the month of evaluation were excluded from that month.

Denominator Exclusion Details (NQF Includes “Exceptions” in the “Exclusion” Field) S.11.

The CMS Long Term Care Minimum Data Set (MDS) was the data source used for determining skilled nursing facility (SNF) patients.

Stratification Details/Variables S.12.

N/A

Risk Adjustment Type S.13.

Statistical risk model

Statistical Risk Model and Variables S.14.

The proposed Percentage of Prevalent Patients Waitlisted (PPPW) measure is a directly standardized percentage, in the sense that each facility’s percentage waitlisted is adjusted to the national age distribution (with ‘national’ here referring to all-facilities-combined). The PPPW for facility j is an estimate of what the facility’s percentage of prevalent patients would equal if the facility’s patient mix was equal to that of the nation as a whole. For each facility, we test the null hypothesis $H_0: PPPW_j = PPPW$, where $PPPW$ (absent the facility subscript) equals the average of the $PPPW_j$ ’s across all facilities.

Detailed Risk Model Specifications S.15.

We assume a logistic regression model for the probability that a prevalent patient is wait-listed. Consider patient i at facility j during calendar month k ; we set the response variate to $Y_{ijk} = 1$ if the patient is on the wait list and $Y_{ijk} = 0$ if not. The model is adjusted for age,

$$\text{logit}(p_{ijk}) = \alpha_j + \beta A_{ij},$$

coded as a linear spline with empirically determined knots at ages 15, 55 and 70. As such, the only factors in the logistic model are age and i and the facility indicators. The model is fitted using Generalized Estimating Equations (GEE; Liang and Zeger, 1986) in order to account for the correlation within-patient across months.

With over 6,000 facilities, it is difficult to estimate all parameters (i.e., including the facility indicators) simultaneously. Therefore, we break the fitting process into stages. At the first stage, we estimate the β vector by averaging 10 subgroups of approximately 600 facilities each. At the second stage, we then estimate the α_j ($j=1, \dots, 6000$) by fitting facility-specific

intercept-only GEE models, with the linear predictor from the first stage, βA_{ij} , serving as an offset. Per well-established GEE results (e.g., Liang and Zeger, 1986), the estimator of α_j is consistent for its target value, and follows a Normal distribution with standard error given by the robust ‘sandwich’ estimator computed via GEE. We can then compute $PPPW_j$ for each facility j as follows:

$$PPPW_j = \sum_i \sum_k \exp(\alpha_j + \beta A_{ik}) / \{1 + \exp(\alpha_j + \beta A_{ik})\} / n,$$

where n = total number of patient-months included in the overall study sample. The standard error of $PPPW_j$ is estimated through the Delta method; i.e., $SE(PPPW_j) = d_j \times SE(\alpha_j)$, where $d_j = \sum_i \sum_k \exp(\alpha_j + \beta A_{ik}) / \{1 + \exp(\alpha_j + \beta A_{ik})\}^2 / n$.

We then carry out a two-sided Wald test (0.05 significance level) that $PPPW_j = PPPW$, where $PPPW$ equals the national average percentage waitlisted. Note that the test is based on the logit of $PPPW_j$, which is much more likely to follow a Normal distribution than $PPPW_j$ itself, due to the symmetry and lack of range restrictions of the transformed version.

Type of Score S.16.

Rate/proportion

Interpretation of Score S.17.

Better quality = higher score

Calculation Algorithm/Measure Logic S.18.

See S.19

Calculation Algorithm/Measure Logic Diagram URL or Attachment S.19.

See Appendix B

Sampling S.20.

N/A

Survey/Patient-Reported Data S.21.

N/A

Missing Data S.22.

N/A

Data Source S.23.

Administrative Claims

Electronic Clinical Data: Electronic Clinical Data

Electronic Clinical Data: Registry

Data Source or Collection Instrument S.24.

CROWNWeb is the primary data source we used for denominator, risk adjustment (age) and exclusion of patients older than 75 year-old (see information provided under “denominator details”). Organ Procurement and Transplant Network (OPTN) is the data source for numerator (waitlisting). The Nursing Home Minimum Dataset is used to identify SNF patients.

Data Source or Collection Instrument (Reference) S.25.

N/A

Level of Analysis S.26.

Facility Level

Care Setting S.27.

Dialysis Facility

Composite Performance Measure S.28.

N/A

DRAFT

Appendix A

Data Dictionary (S.2b.)

Variable	Primary Data Source
Facility CCN #	CMS data sources ^{*1}
Reporting year and month	CROWNWeb
Waitlist status	Organ Procurement and Transplant Network (OPTN)
Date of Birth	CMS data sources ^{*1}
Date of First ESRD	Medical Evidence Form (CMS-2728)
Age at the first day of reporting month	CMS data sources ^{*1}
Nursing home status in the current month ^{*2}	CMS Long Term Care Minimum Data Set (MDS)

*1. Multiple data sources include CMS Consolidated Renal Operations in a Web-enabled Network (CROWNWeb), the CMS Annual Facility Survey (Form CMS-2744), Medicare dialysis and hospital payment records, the CMS Medical Evidence Form (Form CMS-2728), transplant data from the Organ Procurement and Transplant Network (OPTN), the Death Notification Form (Form CMS-2746), the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Workbench, which includes data from the Certification and Survey Provider Enhanced Report System (CASPER), the Dialysis Facility Compare (DFC) and the Social Security Death Master File.

Unique patients are identified by using a combination of SSN, first name, surname, gender, Medicare claim number and birth date. A matching process is performed to ensure that minor typos and misspellings do not cause a patient record to fall out of their history. The matching process is able to successfully match 99.5% of patients. The remaining patients have incomplete or incorrect data that does not allow them to be matched.

*2. Exclusion factors

S.19: Calculation Flow Chart

Percentage of Prevalent Patients Waitlisted (PPPW)

