
CBE ID

5601

Title

Rate of Hospital Referrals of Potential Organ Donors Made to the Organ Procurement Organization (OPO) from within the OPO's Donation Service Area in a Calendar Year

Project

Management of Acute Events, Chronic Disease, Surgery, and Behavioral Health

Endorsement Status

New

Is Under Review

Yes

Next Maintenance Cycle

Spring 2026

Steward

Other

1.0 New or Maintenance

New

1.1 Measure Structure

Single Measure

1.3 Electronic Clinical Quality Measure (eCQM)

No

1.6 Measure Description

This measure is the rate per 100 deaths of ventilated hospital referrals to the OPO of potential donor population in the OPO's Donation Service Area (DSA) within a calendar year.

1.7 Measure Type

Process

1.8 Level of Analysis

Other

1.8b Other Level of Analysis

Organ Procurement Organization - a non-profit organization responsible for the evaluation and procurement of deceased-donor organs for transplantation. OPOs also educate the public to increase awareness and participation in organ donation.

1.9 Care Setting

Other

1.9b Other Care Setting

The OPO is the care setting for which this measure is specified and tested.

1.10 Measure Rationale

This measure is the rate per 100 deaths of ventilated hospital referrals to the Organ Procurement Organization (OPO) of the potential donor population in the OPO's donation service area (DSA) within a calendar year. We will refer to this measure as the Referral Rate measure in this report. The goal of this measure is to provide OPOs with data that will enable them to improve their referral process. While all OPOs count their referrals, they do not all do so in a standardized manner. An improved referral process and standardized way of counting referrals will help achieve the ultimate goal of increasing the number of viable organs available for transplant that are offered to transplant centers.

A hospital's referral of a potential organ donor is the starting point of OPO procurement activity. For a referral to take place, it requires that donor hospital staff understand appropriate clinical triggers, recognize when organ donation is a possibility, and notify the OPO. It is also important that hospitals not over refer individuals who do not meet triggers, as over-referral uses valuable OPO resources. Timely referrals from hospitals are integral in helping ensure that OPOs have sufficient time to assess medical suitability of the potential donor and facilitate adequate time for appropriate conversations with the donor or next of kin. When referral data are broken down by race, gender, and hospital, they can also provide insight into potential bias and hospital participation.

Referral Rate data are valuable for informing quality improvement efforts in education and outreach for hospital staff. Optimization of referral rates can ultimately lead to more organs being available for transplantation, thereby reducing the number of deaths on the organ transplant waiting list. Ongoing relationships between OPO and hospital staff encourage future referrals and organ donation prospects.

Reporting of this measure will enable increased OPO accountability for ensuring effective hospital engagement, which is a primary factor in promoting timely referrals. When OPOs are effectively engaging with the hospitals in their DSA, hospital staff receive training on clinical markers of imminent death, information covering the roles and activity of the OPO staff, and the steps in the organ procurement and transplant process. Additionally, hospital staff are provided with reference resources (e.g., tip sheets) and have regular face-to-face encounters with OPO coordinators who facilitate connections between the hospital and OPO. Collaboration between hospitals and OPO staff creates partnerships in providing patient care and increases the likelihood of organ donation referrals.

Gibson et al. (2023) demonstrated the importance of relationship and collaboration between donor hospitals and OPOs. After reviewing suboptimal donation metrics with their OPO hospital liaison, they implemented a multidisciplinary performance improvement initiative to create a more donation-friendly culture in their facility. Hospital administrative engagement, staff education,

and increased OPO program visibility were key approaches used. Their efforts to improve staff understanding and awareness of organ donation changed referral and compliance patterns, with demonstrated improvements in donation metrics. The relationship between OPOs and donor hospitals is a vital link in the organ donation continuum.

Reference:

Gibson, J. E., Campbell, T., Gibson, K., Kottemann, K., Krause, M. A., & Pack, L. (2023, June 15). Collaborative approach to organ donation in a level II trauma center. *AACN Adv Crit Care*, 34(2), 88–94. doi: 10.4037/aacnacc2023552.

1.11 Measure Webpage

None

1.13 Data Dictionary

Attached

1.13a Attach Data Dictionary

[CBE-5601-1.13a-Referral-Rate-Data-Dictionary-Attachment-A-Spring2026.pdf](#)

1.14 Numerator

The numerator is the number of ventilated patients in the OPO's DSA referred to the OPO in a calendar year, regardless of whether a donation actually resulted from the referral.

1.14a Numerator Details

The numerator for the Referral Rate measure uses data shared directly by six OPOs. The numerator is the number of ventilated patients in the OPO's DSA referred to the OPO in a calendar year, regardless of whether a donation resulted from the referral. The OPO receives telephonic or electronic notification by a donor hospital of a potential donor based on clinical criteria agreed upon between the OPO and the donor hospital in a Memorandum of Understanding (MOU). OPOs maintain MOUs with donor hospitals regarding hospital notification of imminent deaths. These MOUs are specific to each hospital and generally require hospitals to make referrals within 1 to 3 hours of a ventilated patient meeting any of the following established clinical triggers and prior to the withdrawal of mechanical and/or pharmacological support:

- Patient with a neurological and/or life-threatening injury.
- Loss of neurological function without sedation.
- Patient meeting a Glasgow Coma Scale (GCS) of 5 or less.
- Anticipated family meeting to discuss end-of-life care.
- Prior to the discontinuation of ventilator support, the family asks to discuss donation options.

A referral is attributed to a calendar year based on the date of the referral, not the date of death. Referred potential donors are counted as referrals regardless of whether the referral was made using accurate clinical criteria for donation (donor referral triggers).

A potential donor is a hospitalized patient who meets the following clinical criteria for donation:

- Brain death or imminent death from severe brain injury or trauma, cerebrovascular insult, anoxic injury, or amyotrophic lateral sclerosis; or
- Assist-device dependent (e.g., extracorporeal membrane oxygenation (ECMO); or
- Referred as outlined in each OPO-to-hospital MOU, as outlined above.

The potential donors are included in the numerator regardless of whether the referral resulted in an organ transplant into a recipient. Referrals are attributed to the calendar year (time between 12:00 a.m. on January 1 of a calendar year and 11:59 p.m. on December 31 of that same year) based on the referral date.

OPOs capture the ventilator status in their Electronic Donor Record (EDR) at the time of referral from the donor hospital.

Please refer to Attachment B for a list of definitions and acronyms associated with this measure submission.

1.15 Denominator

The denominator is the number of the potential donor population in the OPO's DSA in the calendar year.

1.15a Denominator Details

The denominator uses the National Vital Statistics System (NVSS) Multiple Cause of Death (MCOD) data, which are mapped by county in the OPO's DSA. The NVSS MCOD data are compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Potential donors are then apportioned to OPOs in counties with a waiver hospital based on the percentages calculated by CMS in their OPO Annual Public Aggregated Performance Report.

The denominator for the Referral Rate measure is the number of the potential donor population in the OPO's DSA in the calendar year. The potential donor population includes patients who had no contraindications to donation, as noted in the denominator exclusions in Section 1.15b, are aged 0 to 80 years old who died within a hospital, and had one of the following ICD-10-CM codes listed as the primary cause of death:

- I20-I25 (ischemic heart disease), or
- I60-I69 (cerebrovascular disease), or
- V01-Y89 (external causes of death): blunt trauma, gunshot wounds, drug overdose, suicide, drowning, and asphyxiation.

For MCOD data, a death is attributed to the calendar year based on the time of death (time between 12:00 a.m. on January 1 of a calendar year and 11:59 p.m. on December 31 of that same year), as recorded on the death certificate.

1.15b Denominator Exclusions

The denominator for the Referral Rate measure excludes patient deaths over the age of 80 years old, with no discernible cause of death, and who did not die in a hospital. The denominator further excludes patient deaths with any of the following ICD-10-CM codes listed among the multiple causes of death:

- Bacterial:
 - A15-A19, B90 (tuberculosis)
 - K46.1, K45.1 (gangrenous bowel)
 - K63.1 (perforated bowel)
 - A40-A41 (intra-abdominal sepsis)
- Viral:
 - B20 (HIV infection by serologic or molecular detection)
 - A82 (rabies)
 - A83-86, B33.3, B97.3 (retroviral infections including viral encephalitis)
 - B27 (acute Epstein-Barr virus (mononucleosis))
 - A92.3 (West Nile virus infection)
 - A98.4 (Ebola virus)
- Fungal:
 - B45 (active infection with cryptococcus)
- Parasites:
 - B55 (leishmania)
 - B78.7 or B78.9 (strongyloides – widespread infection)
 - B50-B54 (malaria (plasmodium sp.))
- Prion:
 - A81.0 (Creutzfeldt-Jakob disease)
- D60-D61 (aplastic anemia)
- D70 (agranulocytosis)
- C00-C97 (current malignant neoplasms, except non-melanoma skin cancers such as basal cell and squamous cell cancer, and primary CNS tumors without evident metastatic disease)
- Z85.820 (history of melanoma)
- Hematologic malignancies:
 - C90.1, C91-C95 (leukemia)
 - C81 (Hodgkin's disease)
 - C82-C88 (lymphoma)
 - C90.0 (multiple myeloma)

1.15c Denominator Exclusions Details

Please see Section 1.15b Denominator Exclusions for details on denominator exclusions.

1.15d Age Group

Other

1.15e Age Range in Years

Patients who are 0 to 80 years of age.

1.16 Type of Score

Rate/proportion

1.17 Measure Score Interpretation

Better performance = Higher score

1.18 Calculation of Measure Score

To calculate the numerator for the Referral Rate measure, begin with the set of referrals for an OPO in a calendar year and filter the data to include only referrals where the patient was ventilated and aged 0 to 80 years old. Count the number of unique referrals from this subset; this is the number of referrals for an OPO in the calendar year.

To calculate the denominator for the Referral Rate measure, we use MCOD data from the National Center for Health Statistics (NCHS) and NVSS for the calendar year of interest. The NVSS MCOD data are compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. The death information is filtered based on potential donor criteria (see Sections 1.15a and 1.15b for full descriptions of potential donor requirements and exclusions). Each death is then assigned to their respective OPO based on the geographic location where the potential organ donor died. Alongside this, potential donors are apportioned to OPOs in counties with a waiver hospital based on the percentages calculated by CMS in their OPO Annual Public Aggregated Performance Report. The total number of potential donors per OPO is summarized; this is the total number of potential donors in an OPO in a calendar year.

To calculate the measure, divide the numerator (the number of referrals for an OPO in the calendar year) by the denominator (the number of potential donors in an OPO's DSA for the calendar year) to determine the Referral Rate. This value is multiplied by 100, as the rate is expressed as X per 100 deaths. In addition to calculating the overall measure score, we stratified by demographic information for gender, race, and age.

Please refer to Exhibit 2: Measure Score Calculation Diagram in Attachment B for additional details.

1.19 Measure Stratification Details

We stratified this measure by race to better understand whether different populations are served disproportionately relative to the proportions of potential donors in the DSA. Due to the nature of the data shared by OPOs, we compare "Non-Hispanic White" and "Non-White" populations. People of Hispanic ethnicity are included in the "Non-White" category because some OPOs coded "Hispanic" as a mutually exclusive "race" category.

We stratified this measure by gender to evaluate whether the referrals received by the OPO reflect the gender proportions of deaths in the population in the OPO's DSA.

Stratification by age permits evaluation of the population breakdown of the referrals received by

the OPO as compared to the proportions of potential donors in the OPO's DSA.

Additional stratification information is covered in Section 5.4.

1.20 Types of Data Sources

Electronic Health Records, Other

1.20a Other Data Source

Multiple Cause of Death (MCOB) data from the National Center for Health Statistics (NCHS) and National Vital Statistics System (NVSS), compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.

1.20d Format: Other Data Source

Digital

1.21a Data Collection Tool URL(s)

<http://example.com>

1.25 Data Source Details

Referrals are made to the OPO staff while onsite at the donor hospital, by telephone through a call center, or via electronic submission directly into the OPO's EDR. Of our six OPO test sites, four used LifeLogics/TrueNorth EDR and two used iTransplant/InVita Health EDR. Both systems permit data capture via an application programming interface (API) linked to hospital EHRs—where available and in coordination with donor hospitals—for the input of patient data, including demographic and clinical data. OPOs routinely report donor information as part of regulatory requirements, and data for this Referral Rate measure would be captured through similar mechanisms and procedures.

Many OPOs take advantage of electronic referral tools, while some OPOs rely on manual data entry from phone-based referrals with standardized quality assurance (QA) checks. To address these challenges, OPOs utilize APIs (such as iTransplant's Referral API) to connect with hospital EHR systems or through repeated outreach to the donor hospitals. In some cases, smaller hospitals do not have the infrastructure, capacity, or resources to integrate an API into their older EHRs or to provide all of the data electronically to the OPO. OPOs emphasized maintaining strong points of contact at each hospital within their DSA to foster these data exchanges.

The data for the numerator of the Referral Rate measure comes from structured data fields contained in OPO EDRs. Prior to measure testing, we discussed the nature of the variables with OPOs to understand the data elements and workflows that generated the data points. Through reviews of OPO data, their dictionaries, the logic behind calculated fields, and—in some cases—additional data submissions, we learned how each OPO captured and reported their data. We then engaged in discussions with each OPO to ensure that we obtained and analyzed the necessary data based on the measure specifications and definitions. Other clarifications included alignment on how missing data were handled. For measure implementation, the variable definitions, data capture protocols, QA, and auditing procedures will be communicated across OPOs to align these data elements in a systematic way.

The data for the denominator of the Referral Rate measure came from the MCODE data from NCHS and NVSS. These data were well-structured, defined, and cleaned and presented no feasibility, reliability, and/or validity challenges for the analysis.

1.26 Minimum Sample Size

There is no minimum sample size.

2.1 Attach Logic Model

[CBE-5601-2.1-Referral-Rate-Logic-Model-Attachment-C-Spring2026.pdf](#)

2.2 Evidence of Measure Importance

To validate the importance of the Referral Rate measure for organ donation and to ensure accurate and comprehensive information when developing the measure, we performed an environmental scan of literature about the organ donation and transplant ecosystem (Rahman et al., 2025). We reviewed relevant literature for any measures or data sources that had already been explored and had potential as candidate measures. Based on this review, no appropriate measures were identified, and the team continued exploring alternative evidence for measures and amplified importance.

A thorough review of existing measures in the CMS Measures Inventory Tool (CMIT) also indicated that there were no measures comparable to the one proposed for endorsement (CMIT, n.d.). Therefore, we continued identifying potential measures using the CMS Blueprint Measure Lifecycle as a validated measure development framework.

The CMS Blueprint Measure Lifecycle was used to guide our work due to its rigorous and established approach to measure development and validation (CMS, n.d.). Econometrica operationalized the Blueprint by systematically integrating the conceptualization, specification, testing, implementation, measure use, evaluation, and maintenance phases into the project plan.

To better understand OPO operations, identify considerations for measure development, and reinforce measure importance, we conducted 7 site visits to U.S. OPOs, including organizations with Donor Care Units, totaling 45 individual interviews with OPO leadership, directors, managers, and other essential OPO frontline staff. Econometrica conducted a qualitative analysis of all interviews, which informed the development of the ecosystem map and logic model. We also identified six key aspects of organ procurement that can be measured by OPOs, one of which is referral management. A direct quote from the OPO Site Visit Report emphasizes the importance and need for the proposed referral measure: “The referral process was noted as an area where workload and efforts can go unrecognized if the donation does not proceed and should be measured. Timely referrals from donor hospitals based on correct clinical triggers was identified as an important metric...” (Rahman et al., 2026a).

We convened four meetings with a Technical Expert Panel (TEP) (Rahman et al., 2026b) and assembled an OPO stakeholder group (Rahman et al., 2026c) to gather targeted, informed feedback over five sessions (June 2025 to February 2026). The purpose of the TEP was to provide

expert guidance on project strategy, measure development, and recommendations for new measures. The OPO stakeholder group served to engage OPOs in informing and testing measures and supporting the development of a shared logic model. In Fall 2025, our team solicited feedback from OPO stakeholders on a list of structural, process, and outcome measure candidates. This activity narrowed the list of measure candidates, with referral rate receiving a high percentage of agreement for advancement to the testing phase (Rahman et al., 2026c). During OPO Stakeholder Meeting 3, Econometrica continued in-depth discussions with stakeholders, further solidifying the final measures selected for the testing phase, including Referral Rate (Rahman et al., 2026c).

We also conducted a qualitative study to explore the perspectives of donor families, transplant recipients, and OPO stakeholders to better understand the emotional, practical, and systemic aspects of organ donation and transplantation (Arellano et al., 2025). Although we did not directly align findings with measure implications, the study did reinforce the importance of developing appropriate measures for overall improvements to the organ procurement and transplant system.

Evidence from the literature, TEP and OPO stakeholder group feedback, and public comments indicated the importance of ensuring accurate and timely referrals of donors to identify donor potential (Rahman et al., 2025; Rahman et al., 2026b; Rahman et al., 2026c; O'Connor & Lind, 2025). Organ donation has many inputs and influences, but the initial case for an OPO begins when a referral is received from a hospital regarding a potential organ donor candidate. A key responsibility for OPOs is to track, assess, and manage referrals. OPOs assess the medical suitability of potential donors and utilize Referral Rates to benchmark performance and identify gaps to tailor outreach and education for underperforming hospitals (Rahman et al., 2026a).

Additionally, a consensus study report from the National Academies of Sciences, Engineering, and Medicine (NASEM, 2022) concluded that performance measures for OPOs need to be standardized and aligned in efforts to maximize donor referrals, as there are gaps in standardized and publicly reported measurements related to patient referrals.

Cooperation from donor hospitals is the primary factor affecting the supply of transplantable organs. This has been previously identified in the literature (Prottas, 1988) and remains a key factor. NASEM (2022) noted that, over the past 30 years, evolving state and federal statutes and regulations have addressed the fundamental relationship between donor hospitals and OPOs, consistently identifying the timely referral of all individuals whose death is imminent or who died in the hospital as a key requirement for increasing organ donation. The proposed Referral Rate measure is intended to help improve compliance with hospital regulations related to organ donation and to promote standardized practices for the timely referral of donors and the timely pronouncement of death (NASEM, 2022).

The short-term outputs from the process measure are expected to include increased access to real-time information on donor status, enabling rapid follow-up by OPOs. Prompt follow-up allows for increased and efficient collaboration between hospitals and OPOs, which can lead to improved medical management of potential organ candidates to maximize organ donation once it is determined that donation may be possible. Ensuring an efficient referral process helps minimize variances and process issues associated with donation and reduces missed ventilated referrals.

The overall outcome associated with this measure includes a potential increase in viable organs being available for transplant and offered to transplant centers. Additionally, the outcome of a

more efficient referral process will be a more cost-effective system by reducing resources directed toward inappropriate referrals.

References:

Arellano, O., Rahman, M., O'Connor, J., & Rajakannan, T. (2025). *Perspectives and experiences in organ donation and transplantation: A qualitative study* [Internal document]. Econometrica, Inc., Bethesda, MD.

Centers for Medicare and Medicaid Services. (n.d.). *Centers for Medicare and Medicaid Services Measures Inventory Tool (CMIT)*. <https://cmit.cms.gov/cmit#1/>.

Centers for Medicare and Medicaid Services (CMS) Measures Management System. (n.d.) *Blueprint Measure Lifecycle*. <https://mmshub.cms.gov/blueprint-measure-lifecycle-overview>.

National Academies of Sciences, Engineering, and Medicine. (2022). *Realizing the promise of equity in the organ transplantation system*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26364>.

O'Connor, J., & Lind, C. (2025, August 22). *Public comment report* [Internal document]. Econometrica, Inc., Bethesda, MD.

Prottas, J. (1988). Shifting responsibilities in organ procurement: A plan for routine referral. *JAMA*, 260(6), 832–833.

Rahman, M., Arellano, O., Lind, C., Newton, L., O'Connor, J., Paraboschi, J., & Rizvi, S. (2025, June 20). *OPO measurement literature review report* [Internal document]. Econometrica, Inc., Bethesda, MD.

Rahman, M., Arellano, O., Lind, C., Newton, L., O'Connor, J., & Paraboschi, J. (2026a, April 7). *OPO site visit final report* [Internal document]. Econometrica, Inc., Bethesda, MD.

Rahman, M., Arellano, O., & O'Connor, J. (2026b). *Organ Procurement Organization (OPO) performance measurement technical expert panel (TEP) meetings 1–4 summary overview* [Internal document]. Econometrica, Inc., Bethesda, MD.

Rahman, M., Arellano, O., & O'Connor, J. (2026c). *Organ Procurement Organization (OPO) stakeholder group meetings 1–5 summary overview* [Internal document]. Econometrica, Inc., Bethesda, MD.

2.3 Anticipated Impact

The Referral Rate measure provides meaningful information to all stakeholders about the OPO's performance in receiving referrals from hospitals. Measuring and assessing OPO Referral Rates provides information for OPOs to identify referral process gaps, informing quality improvement needs such as process improvement, hospital referral approaches, education, and support (Rahman et al., 2026c).

As depicted in the logic model, it is anticipated that implementing this measure will lead to opportunities for improvement, including identifying information technology enhancements. This can involve greater implementation of electronic and automated referrals in the hospital's Electronic Medical Record (EMR) system, which OPO stakeholders have stated is helpful in reducing the time nurses spend answering clinical questions about donor suitability, thereby keeping them away from the bedside. This efficiency would improve patient care quality and reduce the related costs of care delivery by promoting system efficiencies. Additionally, NASEM (2022) noted that efficiencies and innovation in the organ donation system include modernizing information technology infrastructure and data collection and highlighted the implementation of automated organ referrals. NASEM (2022) also recommended embedding continuous quality improvement efforts into the organ donation system, including promoting the development, systematic sharing, adaptation, and use of best practices in areas such as rapid referral and early response by donor hospitals and OPOs.

References:

National Academies of Sciences, Engineering, and Medicine. (2022). *Realizing the promise of equity in the organ transplantation system*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26364>.

Rahman, M., Arellano, O., & O'Connor, J. (2026c). *Organ Procurement Organization (OPO) stakeholder group meetings 1-5 summary overview* [Internal document]. Econometrica, Inc., Bethesda, MD.

2.4 Performance Gap

The measure is being submitted for initial endorsement.

CMS assesses OPO performance using two unendorsed quality measures: Donation Rate and Organ Transplantation Rate. A measure of Referral Rates provides essential information to OPOs to support quality improvement efforts directed at increasing referrals, which are the starting point of the organ procurement process.

The numerator data source is the OPO EDR, and the denominator data source is the MCOB data. The data are presented by OPO for our six test site OPOs:

- OPO 1 provided data from 1/1/2021 through 12/31/2024.
- OPO 2 provided data from 1/1/2021 through 12/31/2024
- OPO 3 provided data from 1/1/2022 through 12/31/2024.
- OPO 4 provided data from 1/1/2021 through 12/31/2024.
- OPO 5 provided data from 1/1/2021 through 12/31/2024.
- OPO 6 provided data from 1/1/2021 through 12/31/2024.

The Referral Rates per 100 for our 6 test site OPOs are presented in Exhibit 3: Referral Rates by OPO in Attachment B.

Table 1. Performance Scores by Decile

The Referral Rates per 100 for our 6 test site OPOs are presented in Exhibit 3: Referral Rates by OPO in Attachment B.

2.5 Health Care Quality Landscape

Currently, there is no standardized metric for measuring OPO Referral Rates, creating significant challenges in performance assessment and accountability. The NASEM consensus study report (2022) called for the creation of standardized performance measures based on a consensus-driven process with limited reporting burden on health professionals or patients. OPO stakeholders have indicated that the current CMS measures, specifically denominators for measures, do not capture donor potential. The CMS measures, although valuable, have limitations and do not provide the specificity and nuance required by OPOs to address the complexity of the donor referral process (Rahman et al., 2026c). The proposed Referral Rate measure, developed through the validated and rigorous CMS Blueprint Framework, offers a solution for OPOs to accurately track performance within referrals.

Furthermore, repeated concerns regarding the existing measures were reported during the 2020 OPO rule public comment period, site visit interviews, and meetings with OPO stakeholders (CMS Final Rule, 2020; Rahman et al., 2026a; Rahman et al., 2026c). For example, one such concern is that the current measures do not fall under the OPO scope of control. This was mentioned repeatedly by stakeholders in the OPO Site Visit Report: “Several OPOs expressed concern about performance measures tying directly to activities within the control of the OPO itself” (Rahman et al., 2026a). Additionally, during TEP Meeting 1, the TEP noted “agreement that there are many systematic problems in the (CMS) metrics, such as clear statistical fallacies” (Rahman et al., 2026b).

References:

Medicare and Medicaid Programs; Organ Procurement Organizations Conditions for Coverage: Revisions to the Outcome Measure Requirements for Organ Procurement Organizations. Final Rule. Published in the Federal Register on December 2, 2020, as 85 Fed. Reg. 77898. [Federal Register: Medicare and Medicaid Programs; Organ Procurement Organizations Conditions for Coverage: Revisions to the Outcome Measure Requirements for Organ Procurement Organizations](#).

National Academies of Sciences, Engineering, and Medicine. (2022). *Realizing the promise of equity in the organ transplantation system*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26364>.

Rahman, M., Arellano, O., Lind, C., Newton, L., O'Connor, J., & Paraboschi, J. (2026a, April 7). *OPO site visit final report* [Internal document]. Econometrica, Inc., Bethesda, MD.

Rahman, M., Arellano, O., & O'Connor, J. (2026b). *Organ Procurement Organization (OPO) performance measurement technical expert panel (TEP) meetings 1–4 summary overview* [Internal document]. Econometrica, Inc., Bethesda, MD.

Rahman, M., Arellano, O., & O'Connor, J. (2026c). *Organ Procurement Organization (OPO) stakeholder group meetings 1–5 summary overview* [Internal document]. Econometrica, Inc., Bethesda, MD.

2.6 Meaningfulness to Target Population

The Referral Rate measure is meaningful to the target population of patients and families of organ donation by increasing the accountability of OPOs to improve timely and efficient care, beginning with the referral process. Support of this measure was strong throughout the conceptualization public comment period, with OPOs recommending process measures in nearly every comment (O'Connor & Lind, 2025). These process measures cover various areas within the OPO's control while facilitating the donor management and allocation process. Referral/Response measures is an area that was most recommended and included the following referral attributes: referral verification from hospitals; Referral Rate of eligible donors within the established timeframe; referral volume and timeliness; and referral response practices that ensure that referrals remain viable until the chance to meet with families presents. This information provided further validation that the proposed Referral Rate measure is meaningful, producing information that is valuable in making care decisions.

During our site visits, OPOs provided information about the extensive steps and existing processes in place to ensure timely and effective referrals (Rahman et al., 2026a). They identified that all hospitals in their DSAs have consistent policies on deaths and imminent deaths tracked by the hospitals. Additionally, hospitals have specific clinical triggers that prompt the notification of the OPO of the potential for organ donation. OPOs perform weekly, monthly, quarterly, and yearly audits and reviews of hospital deaths to ensure that all referrals were received, and they assess timeliness of referrals. OPOs also often create benchmarks and goals for timely Referral Rates. These criteria and tracking help the OPO ensure referral compliance and hospital participation.

OPOs reported that tracking Referral Rates through a formal process measure will allow OPOs to benchmark performance, hold hospitals more accountable, support hospitals that may be underperforming, and identify gaps to tailor education, outreach, and training. This measure will reinforce OPO operational best practices for receipt and management of referrals, including developing communication protocols, tracking timely referrals, reviewing missed referrals, reviewing medical rule-out cases, assessing the donor population, utilizing electronic referrals, and using referral cards that registered nurses can complete. Additionally, during site visits, OPOs expressed strong agreement that donor registration and hospital engagement through referrals should be considered for key measurement areas (Rahman et al., 2026a).

References:

O'Connor, J., & Lind, C. (2025, August 22). *Public Comment Report* [Internal document]. Econometrica, Inc., Bethesda, MD.

Rahman, M., Arellano, O., Lind, C., Newton, L., O'Connor, J., & Paraboschi, J. (2026a, April 7). *OPO site visit final report* [Internal document]. Econometrica, Inc., Bethesda, MD.

3.1 Contributions Towards Closing Care Gaps

This domain is optional for the Spring 2026 cycle.

4.1a Data Structure and Availability

All OPOs track their data electronically in EDRs and submit some donation data for regulatory purposes to the Organ Procurement & Transplantation Network (OPTN). All data elements for the measure are available electronically in structured fields. During measure testing, some standardization of data elements was necessary to allow comparisons across OPOs.

OPOs use a combination of real-time data validation to catch missing data at the point of entry and conduct QA checks on a routine basis, often during monthly reviews. OPOs indicated that missing data is infrequent, identified through routine QA checks, and completed after following up with the coordinator or staff member familiar with that stage of the OPO activity. OPOs noted that referrals that conclude with an organ donation have the most complete records, as they have moved through each step of the donation workflow. In contrast, potential donors that do not result in a donation may have less complete records if the donation was authorized and not recovered, there was no authorization, or referrals were medically ruled-out and otherwise did not proceed through the referral-approach-authorization-management-recovery pathway. This type of missing data limits the OPO's ability to understand referral patterns, evaluate missed opportunities, and assess process performance at key decision points. While these issues do not impede measure calculations (since rates rely on MCOD for denominator data), they can limit the OPO's internal visibility into possible operational improvements. Overall, this underscores the importance of identifying and resolving missing, incongruent, irregular, or incomplete data issues in a methodical, predictable, and timely manner.

4.1b Implementation Costs and Burden

Our testing and research indicated that there is little to no additional burden to implementing the Referral Rate measure as defined. Our test sites indicated that the data for the Referral Rate measure are already being collected by OPOs, although some manual data entry is required because some referrals are provided via telephone rather than electronically. There is also manual labor involved for hospital mortality record reviews, which OPOs are already conducting. There is no disruption to workflow, and no significant barriers for implementation of this Referral Rate measure were reported. Feedback from the TEP, stakeholders, and public comments did not indicate a concern with the burden of implementation for this measure (Rahman et al., 2026b; Rahman et al., 2026c; O'Connor & Lind, 2025).

There would be added burden if OPOs were to fully automate referrals or add infrastructure for electronic capture of referrals, as well as added burden to hospitals to add infrastructure for electronic capture of referrals; however, the benefits of automating these referrals outweigh the risks.

References:

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4.1c Confidentiality

Data are collected by OPOs as part of their routine care and are captured in alignment with the Health Insurance Portability and Accountability Act (HIPAA) privacy regulations in secure systems. While OPOs observe HIPAA requirements, they are specifically categorized under an exemption to HIPAA to enable hospital-OPO-transplant center communication. There are no patient confidentiality concerns. For measure testing, the OPO data analysis did not depend on any confidential patient information beyond age (or birthdate). Therefore, unique case IDs were used for each patient record. When our team received the data, no patient names were included. All of our measures are calculated based on patient populations large enough that it would be almost impossible to identify an individual.

For testing, the data from the MCOB file did not include patient names or any other detailed information. We kept the data confidential in alignment with a data use agreement (DUA) with NCHS that included a guarantee to store it in a secure location. The DUA explained our purposes for using the data, which included a replication of CMS measures and the current development of new measures.

4.3 Feasibility Informed Final Measure

All of the data elements used in the measure are collected routinely by OPOs. For some data items, additional coding or details from the OPO were required before the final measure could be constructed. Thus, while initially there were some challenges in constructing some of the variables needed for the measures, with a clearer understanding of measure requirements and definitions, these variables are constructed routinely in the current data management processes of OPOs. We will also be disseminating instructions to OPOs regarding the variables for use in this measure, and a separate project is working on updates to OPO EDRs.

As noted in Section 2.2, we used our extensive collaboration with OPOs, the TEP, and site visits to provide support for a Referral Rate measure that provided meaningful information to OPOs about the success of hospital engagement efforts (Rahman et al., 2026a; Rahman et al., 2026b). Further, these collaborations ensured that the data elements were captured in EDRs and that many OPOs were already tracking this information for internal performance benchmarking and improvement efforts, further demonstrating the feasibility of this measure.

Our initial measure specifications used the assumption that OPOs determined patient ventilation

status at a later point in the process. However, our data collection from test site OPOs and subsequent conversations with OPO staff revealed that ventilation status is collected at the time of referral and is reported in a valid and reliable manner by donor hospitals, as it is associated with the triggers required for hospital compliance with donation. Thus, we were able to update the measure numerator to be the number of ventilated referrals.

References:

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4.4 Proprietary Information

Not a proprietary measure and no proprietary components

5.1.1 Data Used for Testing

OPO test sites provided data for testing, which were exported from their EDRs into Excel workbooks. As noted in Section 1.25 Data Source Details, we received testing data from six OPO test sites. Of these, four sites used LifeLogics/TrueNorth EDR and two sites used iTransplant/InVita Health EDR for donor record management. The data were quantitative, providing patient profile and demographic information for patients referred by a donor hospital to the OPO. The data included information on the referral date, ventilation status, gender, race, and age.

The MCODE file is from vital statistics data gathered by NVSS and managed by NCHS. To obtain the dataset, Econometrica entered into a DUA with NCHS. The DUA explained our purposes for using the data, which included a replication of CMS measures and the current development of new measures. The mortality data includes counts of deaths, single race categories (6 groups, 15 groups, or 31 groups), age groups (single-year age cohorts, 5-year age groups, 10-year age groups, or infant age groups), sex, ethnicity, state, county, underlying cause of death and multiple cause of death (specified in ICD-10 codes, 113 selected causes, 130 selected causes for infants, injury causes, drug/alcohol-induced causes), urbanization, year and month of death, weekday of death, place of death, and autopsy status. The MCODE data were narrowed for testing to include the ICD-10-CM cause of death codes, region information to map the deaths to the DSAs served by specific OPOs, age, and race.

5.1.1a Dates of Testing Data

All data is for a calendar year (1/1 through 12/31):

- OPO 1: 2021-2024
- OPO 2: 2021-2024
- OPO 3: 2022-2024

- OPO 4: 2021-2024
- OPO 5: 2021-2024
- OPO 6: 2021-2024
- MCOB: 2021-2024

5.1.2 Differences in Data

The reliability testing and stratification used the same data that were used to construct this measure. No specific exclusions were made.

5.1.3 Characteristics of Measured Entities

There are 56 OPOs currently meeting the Conditions for Coverage under CMS regulations as of 2023 (CMS, 2020b). CMS categorizes OPOs by the population size of their DSA. Six of the 56 OPOs volunteered to participate in measure testing by submitting anonymized patient data, data dictionaries, and definitions. They also participated in surveys and discussions about their submitted data, definitions, data capture processes, and data quality checks.

Of the six test sites that contributed data, one OPO was in the “less than 2.9 million” size, one was in the “2.9-5 million” size, one was in the “5-7.2 million” size, and three were in the “greater than 7.2 million” size (OPTN, 2025).

Our six test sites were from six states and included OPOs that were ranked as “underperforming” (three OPOs) and “passing” (three OPOs) under the current CMS performance tiers for the existing Donation Rate and Organ Transplantation Rate measures (based on 2023 CMS data) (OPTN, 2025; CMS, 2025). Five of the 6 OPOs have DSA coverage in more than one state, bringing the total count of states in this analysis to 13.

Exhibit 4 in Attachment B includes the characteristics of the six test OPOs. The six sites are reasonably representative of the 56 OPOs.

References:

Centers for Medicare & Medicaid Services. (2020b). Medicare and Medicaid programs; organ procurement organizations conditions for coverage; revisions to the outcome measure requirements for organ procurement organizations. A rule by the Centers for Medicare & Medicaid Services. <https://www.federalregister.gov/d/2020-26329/p-195>.

Centers for Medicare & Medicaid Services. (2025, July). *OPO public performance report*. Quality, Certification & Oversight Reports. <https://qcor.cms.gov/OPOs>.

Organ Procurement and Transplantation Network (OPTN) and Scientific Registry of Transplant Recipients (SRTR). OPTN/SRTR 2023 Annual Data Report. U.S. Department of Health and Human Services, Health Resources and Services Administration; 2025. Accessed February 2026. <https://srtr.transplant.hrsa.gov/annualdatareports>.

5.1.4 Characteristics of Units of the Eligible Population

Please refer to Exhibit 5 in Attachment B for the OPO demographic information.

5.2.1 Level(s) of Reliability Testing Conducted

Person or encounter level (i.e., data element) (e.g., inter-abstractor reliability), Accountable entity level (i.e., measure score) (e.g., signal-to-noise analysis)

5.2.2 Method(s) of Reliability Testing

Referral of a potential donor to an OPO is a critical first step in the donation process and a federal requirement in the United States, under the Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509) and under 42 CFR § 482.45, CMS “Conditions of Participation.” Due to the high-cost, high-consequence nature of organ donor referrals, documentation of whether a referral took place (a binary variable found in health records) has been shown to be highly reliable at (1) the patient or encounter level, (2) the hospital to OPO level, and (3) the entity level.

Person or Encounter Level

The person or encounter-level testing method was auditing, and retrospective mortality reviews were used to audit 100% of the mortality records from the hospital and compare them to the OPOs' referral records. To ensure compliance with federal legal requirements to make referrals of potential organ donors, hospitals have routinely collected individual-level data on referrals in patient medical records. Hospitals use criteria provided by OPTN and specifically agreed to in MOUs with OPOs. The clinical criteria used to trigger referral are relatively uniform across the United States, with some variation in how rapidly (1 hour versus 2 hours) hospitals must refer patients and in whether the hospital must call or may make an electronic referral. These referral data and the associated death record reviews are then included in information that is required under 42 CFR 486.328, to be reported by OPOs to the Scientific Registry of Transplant Recipients (SRTR). Numerous studies have assessed the reliability of organ donation referral data, and several recommended more widespread use of referral data for quality improvement (Johnson et al., 2023; Traino et al., 2012).

However, EMRs are known to vary in reliability based on the complexity and type of data being captured (Chan et al., 2010). For this reason, OPOs do conduct reliability testing using multiple methods. Due to the 2020 CMS regulations that promote competition among OPOs, OPOs consider these data to be proprietary, and these reviews are not often published in the literature.

Due to the requirements in 42 CFR 486.328, all OPOs conduct retrospective mortality reviews comparing hospital death data files with the referrals received at the OPO. These reviews are often conducted on a monthly or quarterly basis, and findings are used to correct OPO referral data and provided to the hospitals to increase referral accuracy. Due to the 2020 CMS regulations that promote competition among OPOs, these data are not generally published but were shared with us as part of this project. For example, OPO X conducts these types of reviews and had a 100-percent match rate between the referrals reported and the hospitals' records in 2024. Please refer to Exhibit 6 in Attachment B for the example of the medical record mortality review. Another OPO (OPO Y) conducts a type of these reviews by sending out a review file of referrals to hospitals, and the hospitals conduct the review against their death files. OPO Y found a 99-percent agreement

rate through this process. Please refer to Exhibit 7 in Attachment B for the example of data validation of the medical record mortality review. The other four OPOs report match rates of 99-100%, but we do not have formal reports to share at this time. All OPOs are required to conduct retrospective medical record mortality reviews of their referral data by CMS.

Based on the value of referral data and the implications for OPO performance, recent studies have called for the use of the individual-level data to develop entity-level measures to assess OPO performance, as is being posed in this measure.

Accountable Entity Level

Reliability testing was conducted using the repeated split-sample methodology described by Nieser and Harris (2024), as recommended by the PQM Endorsement and Maintenance Guidebook (2025). For each of the six OPOs and for each year in the range 2021-2024, the data used to compute the numerator (count of referrals meeting all applicable inclusion and exclusion criteria, obtained from OPO data) were repeatedly resampled to create pairs of half-sample datasets, with each record randomly assigned to one half-sample or the other.

The number of repetitions was 200, which is the approximate size of the smallest OPO-year dataset used for reliability analysis. Each of the 200 half-samples of numerator data was then merged with denominator data (count of potential organ donor deaths meeting all applicable inclusion and exclusion criteria for the same OPO and year, obtained from MCOD data), and the Referral Rate measure was then computed for each half-sample. This allowed the creation of a dataset containing 200 records for each OPO and year, with each record containing the OPO and year, and the rates for each of the two half-samples. The data for each of the 200 sets of OPO-year pairs were then analyzed separately to obtain the correlation between the rates of the two randomly assigned half-samples.

The measure of correlation used was the intraclass correlation coefficient (ICC) for a one-way random effects model—ICC(1)—obtained from the covariance estimates provided by a hierarchical generalized linear model. The ICC(1) provides a measure of the total proportion of total variance of the Referral Rate that is explained by the OPO and year. (We do not currently have data from a sufficient number of OPOs to compute a statistically valid measure of correlation by OPO alone.) The average value of ICC(1) across the 200 repetitions, which is the measure of reliability, was then computed.

References:

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U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services. (2026). 42 C.F.R. § 486.328: Condition: Reporting of data. <https://www.ecfr.gov/current/title-42/part-486/section-486.328>.

5.2.3 Reliability Testing Results

Person or Encounter Level

Please refer to Section 5.2.2 Methods of Reliability Testing.

Accountable Entity Level

The Referral Rate reliability as estimated by the average ICC(1) value has a mean value of 0.9880, with a 95-percent confidence interval of [0.9874, 0.9886].

5.2.4 Interpretation of Reliability Results

Person or Encounter Level

Please refer to Section 5.2.2 Methods of Reliability Testing.

Accountable Entity Level

The estimated Referral Rate reliability is 0.9880, which surpasses the minimum reliability threshold of 0.6. Therefore, this measure meets the Consensus-Based Entity requirements for reliability.

Table 2a. Accountable Entity Level Reliability Testing Results by Denominator,

Target Population Size

Please refer to Section 5.2.2 Methods of Reliability Testing and Section 5.2.3 Reliability Testing Results.

Table 2b. Accountable Entity Level Reliability Testing Results by Reliability Score

Please refer to Section 5.2.2 Methods of Reliability Testing and Section 5.2.3 Reliability Testing Results.

5.3.1 Level(s) of Validity Testing Conducted

Person or encounter level (i.e., data element) (e.g., sensitivity and specificity), Accountable entity level (i.e., measure score) (e.g., criterion validity)

5.3.2 Type of Accountable Entity Level Validity Testing Conducted

Systematic assessment of face validity of the measure's performance score as an indicator of quality or resource use

5.3.3 Method(s) of Validity Testing

Referral of a potential donor to an OPO is a critical first step in the donation process and a federal requirement in the United States, under the Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509) and under 42 CFR § 482.45, CMS "Conditions of Participation." Due to the high-cost, high-consequence nature of organ donor referrals, documentation of whether a referral took place (a structured, binary variable found in health records) has been shown to be valid at (1) the patient or encounter level, (2) the hospital to OPO level, and (3) the entity level.

Person or Encounter Level

To ensure compliance with federal legal requirements to make referrals of potential organ donors, hospitals have routinely collected individual-level data on referrals in patient medical records. Hospitals use criteria provided by OPTN and specifically agreed to in MOUs with OPOs. The clinical criteria used to trigger referral are relatively uniform across the United States, with some variation in how rapidly hospitals must refer patients and in whether the hospital must call or may make an electronic referral. These referral data and the associated death record reviews are then included in information that is required under 42 CFR 486.328, to be reported by OPOs to the SRTR. Numerous studies have assessed the reliability of organ donation referral data, and several recommend more widespread use of referral data for quality improvement (Johnson et al., 2023; Traino et al., 2012).

However, electronic medical records are known to vary in validity based on the complexity and type of data being captured (Chan et al., 2010). For this reason, OPOs do conduct validity testing using multiple methods.

Due to the requirements in 42 CFR 486.328, all OPOs conduct retrospective mortality reviews comparing hospital death data files with the referrals received at the OPO. These reviews are

often conducted on a monthly or quarterly basis, and findings are used to correct OPO referral data and provided to the hospitals to increase referral accuracy. Due to the 2020 CMS Final Rule that promotes competition among OPOs, these data are not generally published but were shared with us as part of this project. For example, OPO Y conducted this type of review and found that 1 percent of the non-referred deaths should have been referred. Please refer to Exhibit 8 in Attachment B for the example of non-referred deaths found through this review.

Because these missed opportunities represent the potential for hospitals to increase organ donation referrals to OPOs, a number of published studies have examined the variability in referrals by hospital setting type. One study conducted in a rural Appalachian acute care hospital found an unidentified referral rate of 7 percent ($n = 19$) and a mis-referral rate of 2 percent ($n = 6$) for 2002 (Carter, 2023). The researcher developed a tool called the Organ Procurement Assessment Tool (OPAT) to assess potential donors and found that the OPAT's reliability coefficient was very high ($\alpha = .92$). Other studies have examined whether referrals in certain in-hospital settings resulted in decreased validity of referral data, and another assessed whether these settings increased downstream rates of authorization (McCallum et al., 2020). Another study looked at missed referrals overall in Canada and found that the missed donation opportunities at the referral stage of the donation process was 3.6 to 4.5 per million population (McCallum et al., 2020). Additional studies have assessed the impact of tools such as electronic referral on increasing individual Referral Rates (Zavalkoff et al., 2023).

While missed referrals of potential donors, opportunities for increasing referrals, and over-referral of donors are known issues associated with validity, the literature generally considers these data to be the best and only source for this information. Based on the value of referral data and the implications for OPO performance, recent studies have called for the use of individual-level development of entity-level measures to assess OPO performance (Adam et al., 2026; Levan et al., 2022; Sauthier et al., 2023).

Accountable Entity Level

We considered both face validity, which is the assumption that the measure reflects what it says it does, and criterion validity. Criterion is the extent to which the measure relates to or predicts an outcome. Criterion validity includes both concurrent validity, which compares the measure in question to another outcome assessed at the same time such as from another data source, and predictive validity, which compares the measure to an outcome assessed at a later time.

Face validity: The data used for this measure represents the only source of information on donation referrals—all such data are ultimately provided by OPOs. These are the only data that can be used to measure this concept. For this measure, the direct counts of referrals were provided by the six participating OPOs, and they are not subjective or constructed. The denominator is what CMS adopted and represents an external, independent estimate of potential donor deaths. For these datasets, missing values were mostly not an issue. We had to remove less than a dozen observations due to missing values on age. No sensitivity analysis was conducted.

Criterion validity: To test concurrent validity, we used the MCODE for each DSA to identify the maximum number of in-hospital deaths. We quantified this by identifying an estimate of the number of hospital deaths that are ventilated (26 percent) in the healthcare utilization data produced by the Agency for Healthcare Research and Quality. We multiplied the number of deaths

by 26 percent to estimate the maximum number of ventilated referrals in a DSA (an upper limit). We compared this to the number of referrals reported to us by our test OPOs to confirm that the counts were within a reasonable range (see Table 1). This added confidence that the OPO is capturing the expected population in their DSA in their referrals.

Table 1. Criterion Validity

	OPO 1	OPO 2	OPO 3	OPO 4	OPO 5	OPO 6
MCOD Deaths	11,604	15,800.18	3,314	9,329	6,341	4,793.58
Max Vent Referrals	3,017.04	4,108.05	861.64	2,425.54	1,648.66	1,246.33
Reported Referrals by OPO	18,734	19,199	7,131	12,887	13,511	8,634
Difference (Count)	-15,717	-15,091	-6,269.36	-10,461.5	-11,862.3	-7,387.67
Difference %	145%	129%	157%	137%	156%	150%

Predictive Validity: We understand the gold standard to demonstrate validity is to determine the degree to which the performance on the measure predicts an outcome. For this measure, we chose approach rate as the outcome. We used simple regression to test the hypothesis that referral rate predicts approach rate. While a small N is a significant limitation of this analysis, we conducted it to ensure that all avenues for analysis were pursued.

Table 2. Referral Rate v. Approach Rate, R-Squared Value = 0.5234

	OPO 1	OPO 2	OPO 3	OPO 4	OPO 5	OPO 6
Referral Rate	161	122	215	138	213	180
Approach Rate	16	36	13	19	18	18

References:

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5.3.4 Validity Testing Results

Please refer to Section 5.3.3 Methods of Validity Testing.

5.3.5 Interpretation of Validity Results

Please refer to Section 5.3.3 Methods of Validity Testing.

5.4.1 Methods Used to Address Risk Factors

Stratification by risk factor category

5.4.2 Conceptual Model Rationale

Because this is a process measure, risk adjustment may obscure critical information. There is some debate in the literature about donation regarding the appropriateness of risk adjustment, but we followed the Office of the Assistant Secretary for Planning and Evaluation's recommendation not to risk-adjust process measures. We calculated stratified rates to understand how the OPOs differed across groups of interest and where there are some historical patterns of different donation rates.

We hypothesized that some entities may have varying numbers of referrals, proportionate to the number of people of races/ethnicities other than white (Non-White) in their donor pool. Stratifying by race allows us to observe potentially differential rates of referral. Similarly, we hypothesized that there will be proportionally more referrals for males due to their overall higher death rates in the under-80 age group we are examining.

We calculated stratified rates to understand how OPOs differed across groups of interest and where there are some historical patterns of different donation rates. We stratified by age, race, and gender. We considered that different age concentrations for the different OPO DSAs could affect the rates. The goal was to test if and how age, race, and gender composition differed and how they could affect the measure outcomes. Specifically, areas with older ages may have higher death rates, but that may not translate directly to higher donation rates. Stratifying by age allows us to observe if Referral Rates differ by age. One perceived issue for OPOs is obtaining full participation in the donation process for all races while also avoiding over-referral of select populations. We have stratified the rates by race to better understand if there are racial differences in donation rates and if minorities have lower referral rates. For gender, men generally have higher death rates at younger ages. Observing the differences by gender will allow us to see if there are noticeable differences in referrals by gender and understand if gender composition affects the measure.

Reference:

Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. (2020). *Second report to Congress on social risk factors and performance in Medicare's Value-Based Purchasing Program*.

https://aspe.hhs.gov/sites/default/files/migrated_legacy_files/195191/Second-IMPACT-SES-Report-to-Congress.pdf.

5.4.2a Attach Conceptual Model

[CBE-5601-5.4.2a-Referral-Rate-Conceptual-Model-Attachment-D-Spring2026.pdf](#)

5.4.3 Variable Distribution Across Measured Entities

Please refer to Exhibit 9 in Attachment B.

Age: The distribution pattern of age is the same for both datasets. There are proportionately more observations in the 25–69 age range.

Race: Despite the necessity to collapse the Non-White category, the distribution across race categories is within 5 percentage points for each group. This suggests that the OPO-reported numbers are aligned with the underlying larger distribution in the MCO data.

Gender: The gender categories are closely aligned across the two datasets. There is less than four percentage points difference at most. This suggests that the distribution across referrals reflects the underlying distribution in the MCO data for potential donors.

5.4.4 Risk/Case-Mix Adjustment Modeling and/or Stratification Results

We selected the stratification variables based on what OPOs, our TEP, and the literature indicated would impact the organ donation process. We did not conduct additional statistical testing of the stratification factors.

5.4.4a Attach Risk/Case-mix Adjustment Modeling and/or Stratification Specifications

[CBE-5601-5.4.4a-Referral-Rate-Risk-Factor-Stratification-Specifications-Attachment-E-Spring2026.pdf](#)

5.4.6 Interpretation of Risk/Case-mix Factor Findings

In this section, we present Referral Rates stratified by age, race, and gender. Please refer to Exhibits 10–15 in Attachment B for the interpretation of our results.

5.4.7 Final Approach to Address Risk Factors

Stratification by risk factor category

6.1.1 Current Status

Not in use

6.1.2 Current or Planned Use(s)

Public Reporting, Regulatory and Accreditation Programs, Quality Improvement with Benchmarking (external benchmarking to multiple organizations), Quality Improvement (Internal to the specific organization)

6.1.4 Attributes for Accountability Use

The Referral Rate measure is the rate per 100 deaths of ventilated hospital referrals to the Organ Procurement Organization (OPO) of the potential donor population in the OPO's donation service area (DSA) within a calendar year. The referral rate provides OPOs with data that will enable them to improve their referral process. While all OPOs count their referrals, they do not all do so in a standardized manner. Improving the referral process and standardizing how referrals are counted will help achieve the ultimate goal of increasing the number of viable organs available for transplant that are offered to transplant centers.

The OPO is the setting for which this measure is specified and tested, where a hospital's referral to an OPO of a potential organ donor is the starting point of the procurement activity. A key responsibility for OPOs is to track, assess, and manage referrals. OPOs assess the medical suitability of potential donors and utilize Referral Rates to benchmark performance and identify gaps to tailor outreach and education for underperforming hospitals (Rahman et al., 2026a). The Referral Rate measure also aims to help improve compliance with hospital regulations related to organ donation and to promote standardized practices for the timely referral of donors and the timely pronouncement of death (NASEM, 2022). As such, this proposed measure is intended to be used by OPOs in the following accountability applications: internal quality assurance and performance improvement (QAPI) activities; quality improvement initiatives with external benchmarking, such as between OPOs to facilitate best practices; public reporting; and regulatory and accreditation programs.

Because the Referral Rate is a process measure, risk adjustment may obscure critical information. We followed the Office of the Assistant Secretary for Planning and Evaluation's recommendation not to risk-adjust process measures (ASPE, 2020). We calculated stratified rates by age, race, and gender to understand how OPOs differed across groups of interest and where there are some historical patterns of different donation rates.

In discussions with OPOs, they reported that, if appropriately used, this measure would help establish best practices. These may include innovation, continuous improvement initiatives, tailored education and training, improved efficiency, greater transparency, and stronger collaboration between OPOs and donor hospitals. Furthermore, optimization of referral rates can ultimately lead to more organs being available for transplantation, thereby reducing the number of deaths on the organ transplant waiting list.

References:

National Academies of Sciences, Engineering, and Medicine. (2022). *Realizing the promise of equity in the organ transplantation system*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26364>.

Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. (2020). *Second report to Congress on social risk factors and performance in Medicare's Value-Based Purchasing Program*. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files/195191/Second-IMPACT-SES-Report-to-Congress.pdf.

Rahman, M., Arellano, O., Lind, C., Newton, L., O'Connor, J., & Paraboschi, J. (2026a, April 7). *OPO site visit final report* [Internal document]. Econometrica, Inc., Bethesda, MD.

6.2.1 Actions of Measured Entities to Improve Performance

Improvement in performance with the Referral Rate measure would mean fewer missed referrals, more timely referrals, and increased hospital compliance with the clinical triggers for donor referral set by the OPO.

OPOs can improve referral rates through Plan-Do-Study-Act cycles and tests of change. Examples of tests of change that OPOs could undertake include the following:

- Engaging in collaboration-building activities, such as more frequent visits with donor hospitals to ensure awareness and accessibility of the OPO staff.
- Collaborating with donor hospitals on training for frontline staff on referral protocols.
- Holding listening sessions with acute care and ICU staff regarding their barriers to referral or reasons for over-referral and then making changes to protocols accordingly.
- Providing job aids for frontline staff on referrals, such as pocket cards or instructional guides in nursing stations.
- Engaging with hospital leadership to ensure that donation and referral are a priority for the hospital.
- Enabling electronic referrals.

6.2.5a Potential Unintended Consequences

This measure has limited to no potential unintended consequences, other than potential misuse or misinterpretation of the meaning of the measure data by regulators. OPOs already make hospitals aware of their referral data and prefer that hospitals over-refer to avoid missing a potential donor. While this measure could reduce over-referral by increasing hospital awareness that over-referral is occurring, it should help OPOs and donor hospitals optimize their referral information.

7.1 Supplemental Attachment

[CBE-5601-7.1-Referral-Rate-Supplemental-Attachment-B-Spring2026.pdf](#)

Developer POC email

JParaboschi@econometricainc.com

Measure Developer POC

Jennifer Paraboschi

Econometrica, Inc.
Bethesda, MD
United States

The measure developer is different from the measure steward

Yes

Steward Address

Steve Miller
McLean, VA
United States

Steward Organization

Other

Steward Organization URL

<https://aopo.org/>

Steward POC email

smiller@aopo.org