



Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to subcriterion 1b).

Brief Measure Information

NQF #: 0703

Corresponding Measures:

De.2. Measure Title: Intensive Care: In-hospital mortality rate

Co.1.1. Measure Steward: Philip R. Lee Institute for Health Policy Studies

De.3. Brief Description of Measure: For all adult patients admitted to the intensive care unit (ICU), the percentage of patients whose hospital outcome is death; both observed and risk-adjusted mortality rates are reported with predicted rates based on the Intensive Care Outcomes Model - Mortality (ICOMmort).

1b.1. Developer Rationale: Prevention of death is the reason why patients are admitted to the ICU. The critically ill are a uniquely vulnerable patient population, and given the high costs of their care, determining which hospitals have higher than expected rates of mortality following ICU admission is a meaningful measure of ICU performance.

S.4. Numerator Statement: Total number of eligible patients whose hospital outcome is death. The measure is risk-adjusted, please see S.18.

S.7. Denominator Statement: Total number of eligible patients who are discharged (including deaths and transfers out to other hospitals).

S.10. Denominator Exclusions: <18 years of age at time of ICU admission, ICU readmission, <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial infarction (MI) and subsequently found without MI or any other acute process requiring ICU care, transfers from another acute care hospital.

De.1. Measure Type: Outcome

S.23. Data Source: Paper Medical Records

S.26. Level of Analysis: Facility

IF Endorsement Maintenance – Original Endorsement Date: Jan 17, 2011 **Most Recent Endorsement Date:** Jan 17, 2011

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? This measure does not require pairing. However, it is recommended that, if measure 702 (Intensive Care: ICU Length of Stay) is used, that measure be paired with this measure to address concerns expressed during the original review that hospitals might lower length of stay by allowing rapid mortality.

1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. **Measures must be judged to meet all subcriteria to pass this criterion and be evaluated against the remaining criteria.**

1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form

0703_ICU_Mortality_Evidence_Attachment_REV20160209.docx

1b. Performance Gap

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- disparities in care across population groups.

1b.1. Briefly explain the rationale for this measure (e.g., the benefits or improvements in quality envisioned by use of this measure)

Prevention of death is the reason why patients are admitted to the ICU. The critically ill are a uniquely vulnerable patient population, and given the high costs of their care, determining which hospitals have higher than expected rates of mortality following ICU admission is a meaningful measure of ICU performance.

1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. (This is required for endorsement maintenance. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included). This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

A number of studies based on various large ICU patient samples have confirmed the marked variability in mortality outcomes. One of the earliest of such studies published in 1993 documented unadjusted in-hospital mortality rates from 42 intensive care units ranging from 6.4% to 40%, with 90% of this variation attributable to patient characteristics at admission. Corresponding observed to predicted mortality ratios varied from 0.67 to 1.25. Several studies have since observed similar wide variability among disparate samples. For instance, in a population of veterans, the mortality range was 2-30%, with observed to expected ratios ranging from 0.62-1.27. Again, in worldwide samples (as in the SAPS 3 database) and in geographically localized samples (California), mortality variability for patients admitted to the ICU persists.

Specifically for this measure, the most recent performance scores are based on data collected between the fourth quarter of 2010 and the third quarter of 2011. 226 hospitals contributed data, representing 69,483 patients and 8,112 deaths, for a overall unadjusted mean mortality rate of 11.67%. The standard deviation in this rate across hospitals was 4.17%, with an interquartile range of 8.56% to 13.68%; the minimum rate observed was 1.31%, while the maximum was 28.16%. The scores by decile are: 1.31% (0th percentile), 6.74%, 8.06%, 9.2%, 10.29%, 11.4%, 12.59%, 13.19%, 14.31%, 16.12%, and 28.16% (100th percentile).

These scores are contrasted with a baseline sample, which was collected from the first quarter to third quarter of 2007. For this baseline sample, the observed unadjusted mortality rate was 13.85%. Compared to the most recent sample, this represents a decline in mortality of 2.18% to 11.67%.

1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.

Knaus WA, Wagner DP, et al. Variations in mortality and length of stay in intensive care units. *Ann Int Med* 1993;118:753-61.

Kuzniewicz MW, Vasilevskis EE, Lane R et al. Variation in ICU risk-adjusted mortality: impact of methods of assessment and potential confounders. *Chest* 2008 Jun;133(6):1319-27.

Render ML, Kim M, Deddens J et al. Variation in outcomes in Veterans Affairs intensive care units with a computerized severity measure. *Crit Care Med* 2005;33(5): 930-9.

Rothen HU, Stricker K, Einfalt E et al. Variability in outcome and resource use in intensive care units. *Intensive Care Med* 2007;33:1329-36.

1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability. (This is required for endorsement maintenance. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.) This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

Among various populations, there are documented disparities in mortality outcomes following admission to the ICU. For instance, disease-specific racial variation has been noted among blacks, who have high mortality for critical care conditions such as sepsis or acute lung injury. In a similar fashion, the elderly have been looked at as a subpopulation in whom higher mortality rates occur after an ICU stay. In one study, older women fared worse than men in ICU outcomes. Age >65 together with mechanical ventilation >7d have together been demonstrated to be cofactors in predicting mortality. Aside from demographics, insurance status has also been implicated as a significant predictor, with the uninsured having higher risk of death.

1b.5. If no or limited data on disparities from the measure as specified is reported in 1b4, then provide a summary of data from

the literature that addresses disparities in care on the specific focus of measurement. Include citations.

Barnato AE, Alexander SL et al. Racial variation in the incidence, care, and outcomes of severe sepsis: analysis of population, patient, and hospital characteristics. *Am J Respir Crit Care Med* 2008 Feb 1;177(3):279-84.

Danis M, Linde-Zwirble WT et al. How does lack of insurance affect use of intensive care? A population-based study. *Crit Care Med* 2006 Aug;34(8):2235-6.

Erickson SE, Shlipak MH et al. Racial and ethnic disparities in mortality from acute lung injury. *Crit Care Med* 2009 Jan;37(1):1-6.

Feng Y, Amoateng-Adjepong Y et al. Age, duration of mechanical ventilation, and outcomes of patients who are critically ill. *Chest* 2009 Sept;136(3):157-64.

Fowler RA, Sabur N, Juurlink DN et al. Sex-and age-based differences in the delivery and outcomes of critical care. *CMAJ* 2007 Dec 4;177(12):1513-9.

Yang Y, Yang KS et al. The effect of comorbidity and age on hospital mortality and length of stay in patients with sepsis. *J Crit Care* 2009 Oct 14. [Epub ahead of print]

1c. High Priority (previously referred to as High Impact)

The measure addresses:

- a specific national health goal/priority identified by DHHS or the National Priorities Partnership convened by NQF; OR
- a demonstrated high-priority (high-impact) aspect of healthcare (e.g., affects large numbers of patients and/or has a substantial impact for a smaller population; leading cause of morbidity/mortality; high resource use (current and/or future); severity of illness; and severity of patient/societal consequences of poor quality).

1c.1. Demonstrated high priority aspect of healthcare

Patient/societal consequences of poor quality, Affects large numbers, Severity of illness, Frequently performed procedure, A leading cause of morbidity/mortality, High resource use

1c.2. If Other:

1c.3. Provide epidemiologic or resource use data that demonstrates the measure addresses a high priority aspect of healthcare.

List citations in 1c.4.

Between 1985-2000, the number of critical care beds in US acute care hospitals increased 26%. In addition, although the number of hospitals offering critical care has decreased, the proportion of total hospital beds assigned to critical care has increased. By 2005, critical care costs in the US were estimated to be \$81.7 billion accounting for 13.4% of hospital costs, 4.1% of the national health expenditures and 0.66% of the gross domestic product. As a result, there is great interest in ensuring critical care is delivered at a high standard. One way in which the quality of ICU care can be measured is in-hospital mortality. As a quality indicator, mortality has been broadly accepted due to its relative ease of measurement and its importance to both clinicians and patients alike. Given the higher death rate of patients admitted to the ICU than those admitted to general hospital wards, mortality is an even more appropriate measure of outcome. In an effort to accurately predict risk of death, general ICU mortality risk-prediction models have been developed and refined over the last 20 years in order to better 'objectively' describe ICU patient populations and use these descriptive variables to estimate patients' risk for death. Patient characteristics, or case-mix, are significant contributors to risk of death, and risk-adjustment is prerequisite.

1c.4. Citations for data demonstrating high priority provided in 1a.3

Gunning K, Rowan, K. ABC of intensive care: outcome data and scoring systems. *BMJ* 1999 Jul 24;317(7204):241-4.

Halpern NA. Can the costs of critical care be controlled? *Curr Opin Crit Care* 2009 Oct 9. [Epub ahead of print]

Halpern NA, Pastores SM et al. Changes in critical care beds and occupancy in the United states 1985-2000: differences attributable to hospital size. *Crit Care Med* 2006;34:2105-112.

Pronovost PJ, Miller MR et al. Developing and implementing measures of quality of care in the intensive care unit. *Curr Opin Crit Care* 2001;7:297-303.

Rosenberg AL. Recent innovations in intensive care unit prediction models. *Curr Opin Crit Care* 2002;8:321-30.

1c.5. If a PRO-PM (e.g. HRQoL/functional status, symptom/burden, experience with care, health-related behaviors), provide evidence that the target population values the measured PRO and finds it meaningful. (Describe how and from whom their input was obtained.)

2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. **Measures must be judged to meet the subcriteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.**

2a.1. Specifications The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

De.5. Subject/Topic Area (check all the areas that apply):

Critical Care, Respiratory

De.6. Non-Condition Specific (check all the areas that apply):

S.1. Measure-specific Web Page (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

S.2a. If this is an eMeasure, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

This is not an eMeasure Attachment:

S.2b. Data Dictionary, Code Table, or Value Sets (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

Attachment Attachment: ICU Outcomes Data Dictionary-633924321323431795.pdf

S.3. For endorsement maintenance, please briefly describe any changes to the measure specifications since last endorsement date and explain the reasons.

No changes have been made.

S.4. Numerator Statement (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome)

IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

Total number of eligible patients whose hospital outcome is death. The measure is risk-adjusted, please see S.18.

S.5. Time Period for Data (What is the time period in which data will be aggregated for the measure, e.g., 12 mo, 3 years, look back to August for flu vaccination? Note if there are different time periods for the numerator and denominator.)

Not-applicable; anyone with an ICU admission meeting eligibility criteria below is in the numerator.

S.6. Numerator Details (All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

Eligible patients include those with an ICU stay of at least 4 hours and >18 years of age whose primary reason for admission does not include trauma, burns, or immediately post-coronary artery bypass graft surgery (CABG), as these patient groups are known to require unique risk-adjustment. Only index (initial) ICU admissions are recorded given that patient characteristics of readmissions are known to differ.

S.7. Denominator Statement (Brief, narrative description of the target population being measured)

Total number of eligible patients who are discharged (including deaths and transfers out to other hospitals).

S.8. Target Population Category (Check all the populations for which the measure is specified and tested if any):

S.9. Denominator Details (All information required to identify and calculate the target population/denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

Eligible patients include those with an ICU stay of at least 4 hours and ≥ 18 years of age whose primary reason for admission does not include trauma, burns, or immediately post-coronary artery bypass graft surgery (CABG), as these patient groups are known to require unique risk-adjustment. Only index (initial) ICU admissions are recorded given that patient characteristics of readmissions are known to differ.

S.10. Denominator Exclusions (Brief narrative description of exclusions from the target population)

<18 years of age at time of ICU admission, ICU readmission, <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial infarction (MI) and subsequently found without MI or any other acute process requiring ICU care, transfers from another acute care hospital.

S.11. Denominator Exclusion Details (All information required to identify and calculate exclusions from the denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

<18 years of age at time of ICU admission (with time of ICU admission abstracted preferably from ICU vital signs flowsheet), ICU readmission (i.e. not the patient's first ICU admission during the current hospitalization), <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial infarction (MI) and subsequently found without MI or any other acute process requiring ICU care, patient transfers from another acute care hospital (i.e. patients whose physical site immediately prior to the index ICU admission was an acute care unit at an outside hospital)

S.12. Stratification Details/Variables (All information required to stratify the measure results including the stratification variables, definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b)

Not-applicable

S.13. Risk Adjustment Type (Select type. Provide specifications for risk stratification in S.12 and for statistical model in S.14-15)

Statistical risk model

If other:

S.14. Identify the statistical risk model method and variables (Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development and testing should be addressed with measure testing under Scientific Acceptability)

Risk-adjustment variables include: age, heart rate ≥ 150 , SBP ≤ 90 , chronic renal, acute renal, GIB, cardiac arrhythmia, intracranial mass effect, mechanical ventilation, received CPR, cancer, cerebrovascular incident, cirrhosis, coma, medical admission or status post nonelective surgery, zero factor status (no risk factors other than age), and full code status (no restrictions on therapies or interventions at the time of ICU admission). The risk-adjustment model is based on the the Intensive Care Outcomes Model - Mortality (ICOMmort) with candidate interactions among variables and variable coefficients customized for the population of interest.

S.15. Detailed risk model specifications (must be in attached data dictionary/code list Excel or csv file. Also indicate if available at measure-specific URL identified in S.1.)

Note: Risk model details (including coefficients, equations, codes with descriptors, definitions), should be provided on a separate worksheet in the suggested format in the Excel or csv file with data dictionary/code lists at S.2b.

Provided in response box S.15a

S.15a. Detailed risk model specifications (if not provided in excel or csv file at S.2b)

Model specifications are available online at:

http://healthpolicy.ucsf.edu/sites/healthpolicy.ucsf.edu/files/documents/ICU_Outcomes_Models_S9.pdf

S.16. Type of score:

Rate/proportion

If other:

S.17. Interpretation of Score (Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score)

Better quality = Lower score

S.18. Calculation Algorithm/Measure Logic (Describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; aggregating data; risk adjustment; etc.)

The hospital's observed mortality rate and risk-adjusted mortality rate are both calculated using the abstracted data. For each hospital, the model produces a median and 95% confidence interval for the Standardized Mortality Ratio (SMR), which is the death rate for the hospital adjusted to the average case mix.

S.19. Calculation Algorithm/Measure Logic Diagram URL or Attachment (You also may provide a diagram of the Calculation Algorithm/Measure Logic described above at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

No diagram provided

S.20. Sampling (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF a PRO-PM, identify whether (and how) proxy responses are allowed.

the first 100 consecutive eligible patients per quarter

S.21. Survey/Patient-reported data (If measure is based on a survey, provide instructions for conducting the survey and guidance on minimum response rate.)

IF a PRO-PM, specify calculation of response rates to be reported with performance measure results.

S.22. Missing data (specify how missing data are handled, e.g., imputation, delete case.)

Required for Composites and PRO-PMs.

In our implementation of this, missing data was not possible (because the hospital cannot close out and submit an incomplete file). If other implementation approaches were taken, for any missing variables we would recommend an assumption that the variable for which a value is missing is in the normal range (that is, the blood pressure was normal or the patient did NOT have a diagnosis risk factor such as cancer). This approach incentivizes the hospital to provide complete and accurate data.

S.23. Data Source (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.24.

Paper Medical Records

S.24. Data Source or Collection Instrument (Identify the specific data source/data collection instrument e.g. name of database, clinical registry, collection instrument, etc.)

IF a PRO-PM, identify the specific PROM(s); and standard methods, modes, and languages of administration.

ICU Outcomes Data Collection Instrument

S.25. Data Source or Collection Instrument (available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

Available in attached appendix at A.1

S.26. Level of Analysis (Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED)

Facility

S.27. Care Setting (Check ONLY the settings for which the measure is SPECIFIED AND TESTED)

Inpatient/Hospital

If other:

S.28. COMPOSITE Performance Measure - Additional Specifications *(Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)*

2a. Reliability – See attached Measure Testing Submission Form

2b. Validity – See attached Measure Testing Submission Form

[0703_ICU_Mortality_Testing_Attachment_REV20160202.docx](#)

3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

3a. Byproduct of Care Processes

For clinical measures, the required data elements are routinely generated and used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order).

3a.1. Data Elements Generated as Byproduct of Care Processes.

[Abstracted from a record by someone other than person obtaining original information \(e.g., chart abstraction for quality measure or registry\)](#)

If other:

3b. Electronic Sources

The required data elements are available in electronic health records or other electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.

3b.1. To what extent are the specified data elements available electronically in defined fields? *(i.e., data elements that are needed to compute the performance measure score are in defined, computer-readable fields)*

[Some data elements are in defined fields in electronic sources](#)

3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.

[We are currently in the process of developing ICU eMeasures based on the Health Quality Measure Format \(HQMf\). We anticipate that there will be two versions of this mortality eMeasure: one to compute the raw \(unadjusted\) mortality rate and another to extract the data elements to compute risk-adjusted rates. The eMeasure will also incorporate ICU risk adjustment methodology that is currently under review for publication. We anticipate that development of this eMeasure will be completed in 2016.](#)

[The HQMF for this eMeasure will be developed using the Measure Authoring Tool based on the Quality Data Model \(QDM\). In addition, we anticipate that we will also be able to define Category I-III Quality Reporting Document Architecture \(QRDA\) documents with the eMeasure HQMF.](#)

3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL.

Attachment:

3c. Data Collection Strategy

Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, costs associated with fees/licensing of proprietary measures) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use). For eMeasures, a feasibility assessment addresses the data elements and measure logic and demonstrates the eMeasure can be implemented or feasibility concerns can be adequately addressed.

3c.1. Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

IF a PRO-PM, consider implications for both individuals providing PROM data (patients, service recipients, respondents) and those whose performance is being measured.

In 187 hospitals in California (from small rural hospitals to the largest teaching hospitals), we have successfully collected this data. The average time per chart for an experienced data collector was 11-15 minutes. We collected data on 100 patients per quarter to minimize the data collection burden while still getting sufficient sample size to get precise estimates of hospital performance. However, an alternative target sample size could easily be chosen by users.

3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm).

No fees or licensing are involved.

4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

4.1. Current and Planned Use

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.

Planned	Current Use (for current use provide URL)
Public Reporting	
Quality Improvement (Internal to the specific organization)	

4a.1. For each CURRENT use, checked above, provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included

4a.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)

These measures were used and publicly reported in California until 2013. At that time, the decision was made to focus on measures required by CMS. Therefore, we are currently working to transform this model into an e-measure for CMS consideration.

4a.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)

This has already been used extensively for accountability. However, we intend to transform to e-measures and have made substantial progress in that direction. We have been able to implement a model that uses data from 2 hospital EMRs and has superior predictive performance to the existing model. A paper describing this is under review. However, we have not yet transformed this model into HQMF. We expect this to be completed in 2016.

4b. Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance

results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4b.1. Progress on Improvement. (Not required for initial endorsement unless available.)

Performance results on this measure (current and over time) should be provided in 1b.2 and 1b.4. Discuss:

- Progress (trends in performance results, number and percentage of people receiving high-quality healthcare)
- Geographic area and number and percentage of accountable entities and patients included

A decline in ICU mortality from 13.85% to 11.67%, representing a change of -2.18%, was observed from 2007 to 2011 in a California sample (see 1b.2, "performance scores over time"). 69,483 patients and 187 hospitals were represented in these data, which was collected as a part of the California Hospital Assessment and Reporting Taskforce (CHART) project.

4b.2. If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4c. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

4c.1. Were any unintended negative consequences to individuals or populations identified during testing; OR has evidence of unintended negative consequences to individuals or populations been reported since implementation? If so, identify the negative unintended consequences and describe how benefits outweigh them or actions taken to mitigate them.

The potential unintended consequence is that hospitals may seek to avoid high-risk patients. One could monitor this behavior by evaluating changes in hospitals' risk-profiles over time. However, in the four years that this model was used for public reporting in California, no such behavior was observed or reported by hospitals (and the program had a very active clinical group).

5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.
Yes

5.1a. List of related or competing measures (selected from NQF-endorsed measures)

0702 : Intensive Care Unit (ICU) Length-of-Stay (LOS)

5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.

5a. Harmonization

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):

Are the measure specifications completely harmonized?

Yes

5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

This measure is completely harmonized with measure 0702: Intensive Care Unit (ICU) Length-of-Stay (LOS)
5b. Competing Measures The measure is superior to competing measures (e.g., is a more valid or efficient way to measure); OR Multiple measures are justified. 5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s): Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)

Appendix
A.1 Supplemental materials may be provided in an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed. Attachment Attachment: S.24-25._ICOM_Data_Collection_Instrument-635900265353226667.pdf
Contact Information
Co.1 Measure Steward (Intellectual Property Owner): Philip R. Lee Institute for Health Policy Studies Co.2 Point of Contact: R. Adams, Dudley , adams.dudley@ucsf.edu , 415-476-8617- Co.3 Measure Developer if different from Measure Steward: Philip R. Lee Institute for Health Policy Studies Co.4 Point of Contact: R. Adams, Dudley , adams.dudley@ucsf.edu , 415-476-8617-
Additional Information
Ad.1 Workgroup/Expert Panel involved in measure development Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development. Not-applicable
Measure Developer/Steward Updates and Ongoing Maintenance Ad.2 Year the measure was first released: 1990 Ad.3 Month and Year of most recent revision: 10, 2011 Ad.4 What is your frequency for review/update of this measure? annually when in use Ad.5 When is the next scheduled review/update for this measure? 12, 2015
Ad.6 Copyright statement: is in the public domain Ad.7 Disclaimers:
Ad.8 Additional Information/Comments: