

Special Article

Hospital Mortality Rates: How Is Palliative Care Taken into Account?

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Abstract

Context. Using mortality rates to measure hospital quality presumes that hospital deaths are medical failures. To be a fair measure of hospital quality, hospital mortality measures must take patient-level factors, such as goals of care, into account.

Objectives. To answer questions about how hospital mortality rates are computed and how the involvement of hospice or palliative care (PC) are recognized and handled.

Methods. We analyzed the methods of four entities: Centers for Medicare & Medicaid Services “Hospital Compare;” U.S. News & World Report “Best Hospitals;” Thomson-Reuters “100 TopHospitals;” and HealthGrades.

Results. All entities reviewed rely on Medicare data, compute risk-adjusted mortality rates, and use “all-cause” mortality. They vary considerably in their recognition and handling of cases that involved hospice care or PC. One entity excludes cases with prior hospice care and another excludes those discharged to hospice at the end of the index hospitalization. Two entities exclude some or all cases that were coded with the V66.7 “Palliative Care Encounter” International Classification of Disease, Ninth Revision, Clinical Modification diagnosis code.

Conclusion. Proliferation of, and variability among, hospital mortality measures creates a challenge for hospital administrators. PC and hospice leaders need to educate themselves and their hospital administrators about the extent to which these mortality rates take end-of-life care into account. At the national level, PC and hospice leaders should take advantage of opportunities to engage these mortality raters in conversation about possible changes in their methods and to conduct further research on this topic. *J Pain Symptom Manage* 2010;40:914–925. © 2010 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

Key Words

Mortality, palliative care, hospice, hospital care, quality of care, measurement, coding

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Introduction

Commercial and government payers and the general public are demanding information about health care quality and costs. Hospital mortality rates are viewed as a key indicator

of quality, and several sources now provide the ability for the general public to look at risk-adjusted mortality statistics and other measures of quality and outcomes for a given hospital.^{1,2} Although not exhaustive, a list of prominent entities measuring and disseminating hospital mortality rates includes government agencies, such as the Centers for Medicare & Medicaid Services (CMS); commercial entities, such as U.S. News & World Report (a general interest magazine), HealthGrades (a health care ratings organization), and Thomson-Reuters (a health care analytics firm); and health care consortia, such as Premier, Inc., the Leapfrog Group, and University HealthSystem Consortium (UHC). Hospital mortality is also a metric used by CMS/The Joint Commission in their “core measures” and, thus, may be incorporated into hospital reimbursement incentive programs.^{3–6}

The presupposition of using hospital mortality rates as measures of hospital quality is that hospital deaths represent medical failure; the more risk-adjusted deaths a given hospital has, the lower its quality of care. Implicit in this “death = poor quality” equation is the message that hospitals with more risk-adjusted deaths than other hospitals could have and should have prevented the marginal difference in mortality. These assumptions have been evaluated in several recent articles.^{7–9}

A methodological assumption in hospital mortality rates is that patient- and hospital-level attributes that are not indicative of quality but are correlated with mortality (e.g., age, acuity of illness when entering the hospital, or disproportionate share of critically ill patients) are adjusted for or factored out of the equation. Whatever hospital-level variability remains unexplained by those factors is assumed to be a valid and trustworthy measure of hospital quality of care. This is the essence of risk adjustment and how it is used in equating mortality with hospital quality of care.

Others have examined whether these approaches do an adequate job of factoring out hospital-level characteristics, such as tertiary referral centers receiving large numbers of critically ill patients from other hospitals.¹⁰ In this article, we focus on patient-level characteristics. If patient-level characteristics are not adequately factored out, then attributing the remaining variability to hospital quality of care is questionable

at best and unethical at worst. As one recent report phrased it, “Holding facilities accountable for patient mortality rates is not just unless relevant factors associated with the patient’s care are taken into account.”^{11(p. 25)} That study found that do-not-resuscitate (DNR) status and palliative care (PC) involvement contributed significantly to the explanation of hospital mortality, above and beyond the standard risk-adjustment model: “These results indicate that DNR and PC designations can identify mortality risk at the margin, controlling for other observed risk factors already in the standard model For example the PC designation identifies patients whose risk of dying is between 9% and 57% greater than predicted by the model....”^{11(p. 31)}

The underlying premise of the hospice care and PC field is that death, except in catastrophic events, is a natural life cycle event; it may be delayed, but it can never be entirely prevented.^{7,8} It is also a fact that many Americans turn to hospitals for their end-of-life care. In this context, and given the findings reported recently by Kroch et al.,¹¹ the primary goal of our study was to determine the extent to which publicly reported hospital mortality rates take PC or hospice involvement into account, describe how they do so, and attempt to understand the reasoning behind their decisions.

Secondary to that, we sought to consider the implications of these mortality rate analyses for our field, specifically for hospital-based PC teams and their hospice partners. We know first hand from working with numerous PC programs that there is widespread misunderstanding among hospital administrators about the meaning of hospital mortality scores and the possible or putative impact of hospice care and PC on those scores.¹²

Methods

We examined well-known national sources of hospital quality or performance data that include mortality scores (based on hospital claims data) as a critical part of their evaluations. We identified more than 15 different entities that calculate hospital mortality rates. We excluded benchmarking entities whose data are not generally made available to the public (e.g., Premier Inc., UHC, and Thomson-Reuters Healthcare).

We excluded the Leapfrog Group, which limits its mortality scores to several high-risk surgeries, such as esophageal resection, pancreatic resection, and heart bypass surgery that rarely involve hospice care or PC. We excluded state-based entities (e.g., Virginia Health Information). We excluded entities that repackage existing CMS “Hospital Compare” mortality data (e.g., Commonwealth Fund). Four entities met our criteria for this review: CMS “Hospital Compare,” U.S. News & World Report “Best Hospitals,” Thomson-Reuters “100 Top Hospitals” (a distinct entity from the Thomson-Reuters Healthcare benchmarking service), and HealthGrades (see Table 1 for brief descriptions of these entities).

We accessed the methodological descriptions from publicly available Web sites^{13–16} for each of these four entities to ascertain the general approach to mortality rate analyses. We coded the following key elements of mortality reporting:

- The most recent mortality rate analysis released;
- The years of data that served as the basis for that analysis;
- The source of the mortality data analyzed;
- The number of specialties, diseases/conditions, or procedures analyzed;
- How much information about mortality is released to the public;
- The window of time for death relative to hospital admission;
- The general risk-adjustment methodology used;
- Whether involvement of PC or hospice care is the basis for exclusion or is incorporated into risk adjustment;

- The relative weight given to the mortality rate, if a composite score for the hospital is created.

A brief description of risk adjustment is warranted. Patient-level risk adjustment controls for how sick those patients were and other patient characteristics, such as sex and age (to our knowledge, none adjust for socioeconomic status at the patient level). Hospital-level risk-adjustment controls for whether the sickest patients tend to be seen in greater proportion at some hospitals rather than others. Determining how sick the patients were is based on the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis codes entered in the administrative or claims data for that hospitalization by that hospital.

How exactly these entities perform their risk adjustment is a critical issue, but it is also a very complex one. The focus of this article is limited to the consideration of hospice care and PC and not on a detailed description or evaluation of these various risk-adjustment approaches from a statistical perspective, which can be found elsewhere.^{1,2,9,10,17–19}

In the context of relying on claims data as the basis for creating mortality scores, hospice care or PC involvement could be ascertained by various means and then interpreted in several different ways. Prior hospice involvement could be ascertained if the entity is using longitudinal, patient-centered data (as opposed to anonymous data limited to the index hospitalization). Another method of taking hospice involvement into account is to determine which cases were discharged into hospice at the end of the index admission. “Disposition

Table 1
Description of Entities Reviewed for Mortality-Reporting Methodology

Entity	Characteristics
CMS “Hospital Compare”	Multidimensional, publicly reported data on hospital processes of care, outcomes (risk-adjusted rates of death and readmissions), and patient satisfaction. Web site allows comparison of three hospitals at a time.
U.S. News & World Report “America’s Best Hospitals”	Annual ranking of hospitals by specialty, using mix of Medicare data, information from American Hospital Association and other sources, and primary data (reputation scores based on specialist surveys). Web site shows detailed scores for every hospital.
HealthGrades	Annual ranking of hospitals by numerous conditions and procedures, based on complication and mortality rates. Web site allows comparison of all hospitals in a given area (city and state), one condition or procedure at a time.
Thomson-Reuters “100 Top Hospitals”	Annual rankings of hospitals generally and separately for cardiovascular care. Multidimensional, but details are not publicly reported.

at discharge” is a uniform data point in all hospital billing data, and there are two hospice-specific codes (inpatient hospice or otherwise).

A third approach would be to determine whether the V66.7 “Palliative Care Encounter” ICD-9-CM code was present among diagnosis codes submitted with the hospital bill. Because the Medicare data files that these entities use include only the primary diagnosis and first nine secondary diagnoses,^{20,21} the V66.7 code would need to be submitted relatively high among the dozens of secondary diagnosis codes typically submitted with complex cases, such as those ending in death.

Simplified, hypothetical case vignettes were developed to illustrate whether each entity would include or exclude a given case from its mortality analysis. This gave us a means by which feedback could be obtained from these entities’ methodologists on the accuracy of our interpretation of their various approaches regarding hospice care and PC involvement. One author (J. B. C.) sent draft versions of [Tables 2 and 3](#) to the methodological contact person at each entity, seeking confirmation that the data elements and interpretations were correct. Representatives of all four entities (or their independent analytic groups) ([Appendix](#)) responded, and revisions were made accordingly.

Results

Our summary of the mortality rate methods for the four entities is shown in [Table 2](#). The most consistent elements are that all four compute hospital mortality rates using Medicare data, the rates are risk adjusted, and mortality is “all cause” (the cause of death is not necessarily related to the disease or hospital care).

Apart from those commonalities, there is wide variability across these entities concerning most of the elements examined. For example, they vary greatly in the number and kind of conditions, procedures, or specialties analyzed. CMS “Hospital Compare” describes three conditions for which 30-day mortality is reported—pneumonia, heart failure, and heart attack—compared statistically with the national average. U.S. News provides 30-day mortality statistics for 12 medical and surgical

specialties. HealthGrades provides up to three different mortality statistics (admission survival, 30-day mortality, and 180-day mortality) for each of 21 conditions and procedures. Thomson-Reuters provides one report on hospital care generally and a separate report on cardiovascular care specifically.

All four entities adjust their analyses of mortality based on patient characteristics—and two entities also include some hospital-level risk adjustment as well. All four entities use different methodologies for risk adjustment ([Table 2](#)). (As of March 2010, Thomson-Reuters includes two different mortality analyses in its “100 Top Hospitals” program. Its own risk-adjusted mortality index of death within the index admission is described here and in [Tables 2 and 3](#), but it also includes the CMS “Hospital Compare” 30-day mortality as a separate component of the overall hospital score.) For most entities, the codes used in risk-adjustment are those associated with the index admission, but in the case of CMS “Hospital Compare,” the risk adjustment draws on conditions documented in any inpatient or outpatient setting up to 12 months before the index admission. The methodological details of these risk-adjustment approaches are beyond the scope of this article but are accessible for review.^{13–16}

Hospice and Palliative Care Involvement

As indicated in [Table 2](#), currently, of these four entities, only CMS is accessing longitudinal, patient-centered data across multiple settings and episodes for the year before the index admission and is excluding cases based on prior (or on first day of admission) hospice enrollment.

Exclusion of cases that were discharged from the hospital to hospice is an approach used only by HealthGrades at this time, but those exclusions are applied only for medical conditions, such as sepsis, pancreatitis, and chronic obstructive pulmonary disease. Hospice cases are not excluded from their evaluation of procedural cases, such as heart bypass surgery, valve replacement surgery, or gastrointestinal surgeries and procedures.

The V66.7 “Palliative Care Encounter” code is used by Thomson-Reuters and HealthGrades as the basis for exclusion (again, for HealthGrades, this exclusion applies only to medical

Table 2
Methods Used in Mortality Analyses

Characteristic	CMS "Hospital Compare" ¹³	US News & World Report "Best Hospitals" ¹⁴	Thomson-Reuters "100 Top Hospitals" ¹⁵	HealthGrades ¹⁶
Most recent (as of June 2010)	July 2009	July 2009	March 2010	October 2009
Years analyzed	July 2005–June 2008	2005–2007	2007–2008	2006–2008
Data analyzed for mortality score	MedPar data (top 9 diagnosis and top 6 procedure codes from index admission and prior year)	MedPar data (top 9 diagnosis and top 6 procedure codes from index admission)	MedPar data (top 9 diagnosis and top 6 procedure codes from index admission)	MedPar data (top 9 diagnosis and top 6 procedure codes from index admission)
Diseases or specialties	Pneumonia, heart attack, heart failure	12 specialties scored using mortality data and other criteria, with top 50 ranked	Hospital level for their general report; separate report on cardiovascular diseases	12 diagnoses and 9 procedures
What the general public can see	A percentage mortality rate for each condition and ability to compare any given hospital mortality rate with national average mortality rate	Mortality index for each of these specialties for any given hospital, and reputation, other score components, and total score	Top-scoring hospitals are listed, but detailed scores (e.g., mortality) are provided only to those purchasing the full report	Ratings indicating mortality rate are "best," "as expected," or "poor," for each condition/procedure; list of top-scoring hospitals across all conditions/procedures
Death within ...	30 days from admission	30 days from admission	Index admission	<ul style="list-style-type: none"> • Index admission • Admit + 30 days from discharge • Admit + 180 days from discharge
Risk adjustment methodology	Two-level (hierarchical) modeling, including both patient variables and hospital-level clustering of severely ill cases. Uses patient data from year before admission and from index admission, for risk adjustment	Patient level only, based on 3 M All Patient Refined Diagnosis-Related Groups (APR-DRG)	Logistic regression incorporating both patient- and hospital-level variables	Patient-level only
Hospice utilization considered?	Excluded if Medicare Hospice Benefit enrollment in previous 12 months or first day of admission; not otherwise excluded or incorporated into risk adjustment	Not excluded; not incorporated into risk adjustment	Prior or concurrent use not excluded or incorporated into risk adjustment. Admissions ending in discharge to hospice are survivors of the index admission (only index admission analyzed, not 30-day mortality)	Prior or concurrent use not excluded or incorporated into risk adjustment. Admissions discharged to hospice excluded in 12 diagnosis-based cohorts; not excluded or otherwise incorporated into risk adjustment for procedure cohorts
Palliative care considered?	Not excluded; not incorporated into risk adjustment	Not excluded; not incorporated into risk adjustment	Excluded—based on V66.7 Palliative Care Encounter ICD-9 code	Excluded in 12 diagnosis-based cohorts; not excluded or otherwise incorporated into risk adjustment for procedure cohorts

Mortality's weight within hospital's composite score	No composite score (other measures include readmission rates, processes of care, and patient satisfaction)	Mortality is 32.5% of composite score	No composite score for hospitals is reported, but their proprietary measure of index admission mortality is weighted at 11% of total, and CMS's "Hospital Compare" 30-day mortality is another 6% of the total	Mortality rate comprises the entire hospital score for those 21 conditions/procedures. Other aspects of care (e.g., intensive care unit staffing through Leapfrog Group) are also provided
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conditions and not procedures). This code is not among those incorporated by CMS into its risk adjustment²² and does not seem to affect the U.S. News & World Report's risk adjustment. Apart from exclusion, these entities also have the option to incorporate PC or hospice care involvement in risk adjustment, but none are doing so currently.

Hypothetical Scenarios

Hypothetical cases were developed to explore whether cases involving hospice care and/or PC involvement are included or excluded from the mortality analysis for each entity. All four scenarios involve an elderly patient with pneumonia, hospital entry, and death within 30 days of that hospital entry.

Scenario 1: Palliative Care Consultation. An elderly patient is admitted to the hospital with pneumonia. On the seventh day of admission, he is seen by the hospital's PC consultation team for help with symptom control and clarification of goals of care; this was documented with the V66.7 "Palliative Care Encounter" ICD-9-CM code in the claims data (and this happens to be positioned among the top nine diagnoses submitted to Medicare with the hospital claim). The patient dies in the hospital one week later. The patient was not enrolled in hospice at any point.

CMS and U.S. News & World Report would include this death in their mortality analyses. HealthGrades and Thomson-Reuters would exclude the case because of the V66.7 code. Note, only the top nine diagnosis codes are available to them through the Medicare Provider Analysis and Review (MedPAR) data files used by all four entities.

Scenario 2: Hospital Discharge with Immediate General Inpatient Hospice Care Admission. An elderly patient is admitted to a hospital for pneumonia. On the fourth day of admission, he is enrolled in the Medicare Hospice Benefit (General Inpatient [GIP] Care). Administratively, the hospital discharges the patient, and he is simultaneously enrolled in the Medicare Hospice Benefit; his remaining care is billed under hospice, even though the patient never physically leaves the hospital bed.^{23,24} The patient dies the following day. Medical records

Table 3
Inclusion/Exclusion Summary

Scenarios	CMS "Hospital Compare"	US News & World Report "Best Hospitals"	Thomson-Reuters "100 Top Hospitals"	HealthGrades
1. Palliative care consultation	Include	Include	Exclude ^a	Exclude ^a
2. Discharged to hospice	Include	Include	Exclude ^b	Exclude ^c
3. Hospice revoked	Exclude ^d	Include	Include	Include
4. Hospice GIP admission	NA ^e	NA ^e	NA ^e	NA ^e

GIP Hospice = Patient enrolled in the Medicare Hospice Benefit, admitted to a hospital setting (for, e.g., relief of acute symptoms that could not be managed in home setting), but remains under the Medicare Hospice Benefit.^{23,24}

Explanation of exclusions are as follows.

^aExcluded if V66.7 "Palliative Care Encounter" ICD-9-CM code present (must be among top 9 diagnoses submitted).

^bTechnically, patient survived this acute admission; this entity uses admission mortality, not 30-day mortality.

^cCases excluded if discharged to hospice.

^dCases excluded if enrolled in hospice in previous 12 months or on first day of index admission.

^eNot acute hospital admission, therefore, not included in hospital mortality rate reporting.

do not include a PC encounter (V66.7) code during the acute admission.

Thomson-Reuters would consider this patient to have survived the inpatient admission, because he was "discharged" to hospice even though he never left the hospital bed. The three other entities use 30-day mortality. Two of them, CMS and U.S. News & World Report, do not take into account the disposition at discharge, essentially ignoring the involvement of hospice at the end of acute hospitalization, and would include this death in their mortality analyses. HealthGrades excludes cases that were discharged to hospice, at least for medical conditions, such as pneumonia.

Scenario 3: Hospice Revoked. An elderly patient is managed with home hospice services paid by the Medicare Hospice Benefit for six weeks. The patient becomes acutely ill at home, and the family decides to admit the patient to the hospital for life-prolonging treatment; he revokes his Medicare Hospice Benefit. The patient dies during the admission without further involvement of hospice care or PC.

Based on this scenario, three of the four entities would include this patient in their mortality-reporting analysis. Only CMS "Hospital Compare" would exclude this case, because the patient was enrolled in the Medical Hospice Benefit in the previous 12 months.

Scenario 4: General Inpatient Care Under Hospice. An elderly hospice patient with pneumonia is admitted to the hospital under the Medicare Hospice Benefit for GIP care^{23,24} to address difficult symptoms that were not manageable at home. The patient, who remains on the

Medicare Hospice Benefit, dies after six days in the hospital.

In this scenario, the patient has entered the hospital, but his care is billed under the hospice benefit; this is not seen as an acute admission by any of the entities. In other words, this utilization is not submitted to Medicare as an acute hospitalization, and this death, although occurring within the hospital's walls, is technically not a hospital death.

The approach each entity would take—to include or exclude such deaths in their hospital mortality analyses—is summarized in Table 3. The only scenario that all four entities would agree upon is that a hospice admission to an inpatient setting is not an acute hospitalization and is not part of hospital mortality rate analyses at all (hospice care is hospice care, regardless of the setting in which it is provided). Of the four entities examined, HealthGrades and Thomson-Reuters are most similar to one another, and CMS and U.S. News are relatively similar to each other, in their interpretations of these cases involving hospice care or PC.

Discussion

Many conceptual, methodological, and statistical issues are involved in determining whether it is valid to use general mortality rates to differentiate hospitals in terms of quality of care. One such issue is whether mortality scores account for the inevitability of death, for cases where death was inevitable.^{7-9,11} Hospice involvement is, perhaps, the clearest signal that the patient, family, and health care providers recognize that death is

approaching and is inevitable. Involvement of hospice is documented in at least two data systems: the Medicare enrollment database and Medicare claims data. Only CMS "Hospital Compare" recognizes prior hospice involvement (based on matching cases to the Medicare Enrollment Database), and only HealthGrades recognizes, at least for medical conditions, hospice involvement at the end of an admission (based on the "disposition at discharge" field in the hospital claims data).

Involvement of hospital-based PC professionals during the index admission would not in and of itself be a clear signal that death is imminent for those patients, as PC is not mutually exclusive with curative or life-prolonging treatment of the underlying disease or condition. However, the description currently used for the appropriate use of the V66.7 "Palliative Care Encounter" ICD-9-CM code does seem to be focused on terminal or hospice care,^{25,26} and therefore, its use as the basis for exclusion by Thomson-Reuters and HealthGrades does seem consistent. Two benchmarking entities, UHC and Premier, Inc., have reported elsewhere that this code or other documentation of PC involvement makes a statistically significant contribution to the explanation of variance in observed hospital deaths.^{11,27}

Currently, the V66.7 "Palliative Care Encounter" code appears to be geared toward end-of-life care (only) and not concurrent management of pain and other symptoms.^{25,26} Although this is only part of what PC teams do in hospitals, this interpretation of the code does speak to the issue of goals of care and is, thus, relevant to the discussion here about hospital mortality rates.

Commonalities and Differences in Handling Palliative Care and Hospice Care

Why do these entities computing mortality rates have so much variation regarding the involvement of hospice care and PC? Based on our communications with the methodological contacts at each entity (or with the third party actually conducting the analyses), there were four common threads regarding their intentions and methods. First, all acknowledged that a clear signal that the entire episode of hospitalization was focused solely toward comfort care would be a cause for considering the

exclusion of such cases in the computation of hospital mortality rates.

With that said, a second thread was that these entities differ as to whether the data available to them can indeed provide a clear signal about goals of care during a specific episode. Concerns were raised about the relatively infrequent and inconsistent use of the V66.7 "Palliative Care Encounter" code (recall that these entities see only the top nine secondary diagnoses currently available in Medicare data sets). There are multiple obstacles in obtaining hospice enrollment or claims data and matching that with patients' hospitalization data. The MedPAR data set includes a field indicating the time span from hospitalization to death, making it useful for hospital mortality analyses, but does not include beneficiary identifiers that would allow it to be linked to hospice claims or enrollment. Other identifiable data sets available from Medicare for research projects are not obtainable by commercial entities for commercial purposes (see criterion #7 of CMS's "Criteria for Review of Requests for CMS Research Identifiable Data" at http://www.cms.gov/PrivProtectedData/02_Criteria.asp#TopOfPage). Medicare's Limited Data Set, on the other hand, which can be requested by commercial entities, does not provide the means by which the time interval could be determined between various health care utilization episodes (e.g., hospice utilization and hospital inpatient admissions) or between utilization and death.

Third, these representatives made the argument that if they are going to use hospital mortality rates, then they must be careful not to exclude hospital deaths too liberally, which would pose both conceptual and statistical threats in evaluating hospitals on their mortality rates. As others have pointed out, a condition or procedure that generally has few deaths in the numerator will not be a good candidate for these analyses.⁹

Fourth, mortality rate analyses attempt to control for patient- and hospital-level factors that occur before hospital care (not afterward); excluding cases that involved hospice only at the very end of an admission may create an incentive for hospitals to use hospice as a way to hide or cloak problems with their quality of care earlier in the admission. For that reason, CMS excludes cases with hospice

involvement only if that involvement occurred in the year before or during the first day of acute hospitalization. HealthGrades takes a different approach to achieve the same end: Hospice involvement is a cause for exclusion only for medical conditions and not for surgical procedures. Both approaches try to navigate among the various hazards while preserving mortality rates as a useful and universal measure.

The Role of the V66.7 “Palliative Care Encounter” Code

Based on our own research projects, we cannot disagree with the assessment that the V66.7 “Palliative Care Encounter” code does not appear consistently in the top nine diagnosis slots submitted to Medicare for reimbursement. In our multihospital assessment of the financial impact of PC, 3051 PC consultations were documented separately from the claims data, but only 558 (18%) of these had a V66.7 code among the top nine diagnosis positions in the claims data.²⁸ Similarly, Kroch et al.¹¹ relied on chart reviews to identify PC involvement, because the V66.7 code was not a sufficient means to ascertain that.

Although this may at first seem to provide a rationale for all entities to ignore the code entirely, consider also that UHC has found that the V66.7 code is a strong contributor to the prediction of hospital mortality for more than 50 disease-specific models,²⁷ perhaps because it does not limit its analyses of mortality rates to the top nine diagnoses (it uses up to 99). Indeed, they indicated that it is a particularly strong predictor.

In most of the diagnosis-related group (DRG)-specific models where PC (represented by the V66.7 code) was included as a variable, it had one of the highest positive coefficients, which would result in a higher expected probability of mortality when coded. For two discharges in the same DRG with exactly the same demographics and list of diagnosis and procedure codes except for the PC code, the expected probability of mortality for the discharge with the PC code would be higher than the probability of mortality for the discharge without that code (Jodi Neikirk, Clinical Data & Informatics, University Healthsystem Consortium, October 24, 2008; personal communication). Importantly, analyses of the UHC national data set reveal that among cases where the V66.7 code

was present, only 41.1% had it positioned high enough to be included in the Medicare data sets used by the four entities reviewed here.²⁷

Thus, the V66.7 code has been found to be an important factor in risk adjustment of hospital mortality rates, but it is typically positioned too low to be included in the Medicare data sets used for the hospital mortality rate analyses reviewed here. (Its low positioning may be because of the fact that it is not the kind of secondary diagnosis that affects the assignment of DRGs and, thus, does not contribute significantly to hospital reimbursement.) This speaks to the concern raised by others whether “coding depth”—that is, whether all relevant predictors of mortality are actually included among codes used in analyses—contributes significantly to bias.^{9,29} And it also speaks to the concern raised by others¹¹ that inadequately capturing and analyzing patient variables, such as goals of care, would make it unjust to equate differences in hospital mortality rates with real differences in hospitals’ quality of care.

Summing Up the Conundrum

The following observations emerge from this study:

- To be a valid and ethical measure of differences in hospital quality of care, mortality rate analyses must take all patient factors into account.
- One such factor is the goals of care for a given hospitalization: was it focused on comfort care rather than curative or life-prolonging care?
- DNR status and PC involvement have been shown to predict mortality.¹¹
- When not limited to Medicare data limitations, the V66.7 “Palliative Care Encounter” code has been shown to predict mortality.
- In most of the cases, the V66.7 code is positioned too low to be visible to entities relying on Medicare data sets. (Medicare plans to increase the number of diagnoses it accepts with hospital bills starting in January 2011,³⁰ but it will be another three to four years before the entities using Medicare data sets will have several years’ worth of expanded diagnosis data.)
- Most entities evaluating hospitals on mortality rates rely solely on Medicare data, and some conclude that PC involvement

(based on the limited incidence of it visible to them) does not help to predict mortality.

- Apart from the V66.7 code, these entities have a variety of reasons (such as identifiable data not being available to them and fear of creating new unintended consequences) why they do not incorporate hospice utilization into their exclusion criteria or risk adjustment.

One way to undo a knot is to cut all the way through it, and several experts have recommended that general hospital mortality rates (as measures of hospital quality) simply go away.⁹ Not only is it unlikely that official public agencies, such as Medicare, will eliminate hospital mortality rates from their roster of metrics, it is even more unlikely that private entities will cease and desist in this practice.

Another approach would be for these entities to limit mortality rate analyses to procedures (such as the high-risk procedures that the Leapfrog Group uses) or acute illnesses (such as acute myocardial infarction) that do not overlap much with end-of-life care for chronic conditions. Again, there is currently no external incentive for most of these entities to limit their analyses in this way.

An incremental improvement would be for Medicare to capture all diagnoses submitted with hospital bills and not arbitrarily limit those to nine or 25 diagnoses. This would be one way to resolve the conflict inherent in our observations mentioned earlier that, on the one hand, PC involvement does make analysis and interpretation of mortality rates more meaningful,¹¹ but on the other hand, the V66.7 code is usually positioned too low among secondary diagnoses to be available in Medicare data sets. Independent of that, another solution is to encourage hospitals to consider positioning manually the V66.7 code higher so that it is visible for consideration by external entities evaluating mortality (or other metrics).

We would encourage all commercial entities performing these analyses to try to convince CMS to provide beneficiary identifier information in the MedPAR data set that would allow them to evaluate prior or concurrent hospice involvement, and beyond that, to use 12 months of prior inpatient and outpatient utilization in adjusting for risk of mortality.

Conclusion

Measuring hospital quality using mortality rates is a contentious topic. Confusion is inevitable when each entity measures mortality differently. The interface of hospital mortality rate data and hospice or PC services is complex. Given the general level of confusion and interest in this topic in hospitals today, hospice and PC professionals will benefit from fully exploring the dimensions of patient-centered quality care reflected by both mortality data and PC impact data and by sharing these analyses with hospital executives. PC leaders may also be able to make a strong case that PC outpatient clinics will do more to manage patients appropriately with fewer inpatient admissions toward the end of life.^{31–33}

At the national level, there is a need for better research to model the statistical impact of inclusion or exclusion of hospice- and PC-involved cases, or the incorporation of those variables into risk adjustment. Would such practices reduce or increase bias or inflate or deflate mortality rates for hospitals with varying degrees of hospice and PC utilization? As a field, we could also simultaneously engage the reporting entities in a dialogue to explore how best to recognize that many patients use hospitals for their end-of-life care and that goals of care need to be factored into the equation that hospital mortality is synonymous with hospital quality. Such a dialogue may lead to revision of the inclusion and exclusion criteria and risk-adjustment models used for computing hospital mortality rates.

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Appendix

Methodological Experts Contacted at Each Entity

- For CMS: Dr. Elizabeth Drye (Yale University), Angela Merrill (Mathematica-MPR, Inc.).
- For U.S. News: Dr. Murrey Olmsted (RTI International).
- For HealthGrades, Inc.: Kristin Reed, MPH.
- For Thomson-Reuters: Dr. David Foster, Jean Chenoweth.