Comorbidity Coding and Its Impact on Hospital Complexity

To the Editor:

I read with interest the article by Sosa and colleagues[1] in which they present some stimulating analyses pertaining to a topic that we have been discussing at my institution for several years. Part of this discussion deals with the complexity of our hospital and how complexity is affected by comorbidity coding.

In 2013, we implemented the International Refined-DRGs (IR-DRGs) system to measure complexity at our hospital in Bogotá, Colombia. Our perception at that time was that the case mix index (CMI) was very low (0.7566), even for a general hospital with a high volume of pathologies with low relative weight (RW). Two medical auditors were assigned to review the medical records in order to improve the quality, quantity, and order of diagnoses. Emphasis was placed on patients with stays longer than 5 days and with only 1 diagnosis coded at admission. Additionally, *International Classification of Diseases 10th Revision* (World Health Organization version) diagnoses from chapters R (Symptoms and Signs Not Elsewhere Classified) and V through Y (External Causes) were blocked in the electronic health record. With these measures, our CMI increased 74%, reaching 1.3151 by the end of 2021, with a maximum peak of 1.6743 in May 2021, which coincided with the third peak of COVID-19 in Colombia.

However, the article by Sosa and colleagues draws my attention to the following: why do the authors state that their CMI is low and the patient acuity was underrepresented? Is this due to a comparison with similar hospitals, or to a recommendation from a regulatory agency? We have found our CMI remains low because of a high volume of nonsurgical care (60%), deliveries, and digestive, respiratory, and urinary pathologies of low RW.

Also, was the perceived low CMI causing problems with payers? And further, how did the authors avoid the risk of artificially increasing the CMI through overdiagnosis of patients, and were there audit mechanisms to avoid this? While there was a clear change in expected mortality, did the observed mortality also change with the strategies implemented? This last question is relevant because, if the observed mortality were maintained, this would provide evidence that a coding problem was the cause of their hospital's low CMI.

I reiterate my congratulations to the authors for presenting analyses that are very useful to other providers and researchers worldwide interested in addressing management issues related to the correct identification and classification of patients.

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Reference

1. Sosa M, Ferreira T, Gershengorn H, et al. Improving hospital metrics through the implementation of a comorbidity capture tool and other quality initiatives. *J Clin Outcomes Manage.* 2022;29(2):80-87. doi:10.12788/jcom.0088

Authors' Response

We agree with the valid comments made by Dr. Kerguelen and will respond to each set of questions in order.

Regarding the first set of questions on how we knew that our CMI was low and our patient acuity was underrepresented, the University of Miami Health System is a designated cancer center with a Prospective Payment System exempt model (PPS exempt), and is one of 11 hospitals in the United States excluded for payment under the Inpatient Prospective Payment System. We know, therefore, that we care for a very complex patient population. Additionally, we benchmark ourselves against other academic medical centers (AMCs) with similarly complex patients and had noted that our patients appeared "less complex." Specifically, our baseline CMI

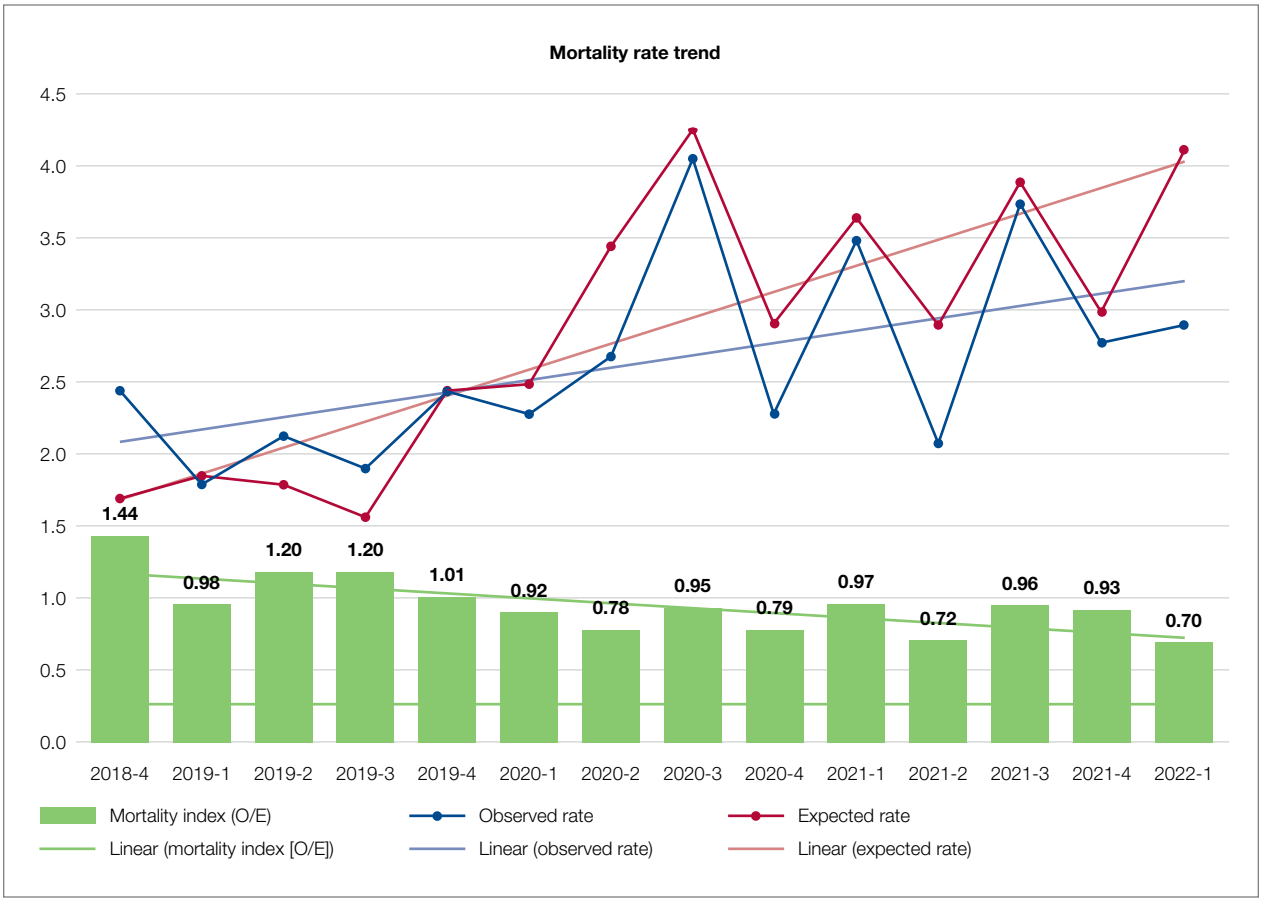

Figure. Quarterly trend of mortality index, expected mortality, and observed mortality. *P* values for trends using univariable linear regression: mortality index, $P = .003$; observed rate, $P = .06$; expected rate, $P = .001$.

was 1.77 in early 2018 compared with an overall higher CMI for the AMC cohort; also, the total number of diagnoses we captured was lower than that in other AMCs. These 2 facts together alerted us that we likely had coding and clinical documentation improvement (CDI) opportunities. We recognized that our complexity was not being captured both because the clinical information was not documented in a manner readily translatable to ICD-10 codes and codes were missed when the documentation did exist. To remedy these problems, we implemented multiple immediate "fixes," which included revamping our CDI efforts, re-education, and enhancements to our electronic health record for providers, CDIs, and coders. Since publication of our article, our CMI has continued to increase month over month, up to 2.57 most recently in May 2022, as we have continued to focus on several additional initiatives to impact both better documentation and coding.

The second set of questions asked whether the perceived low CMI was causing problems with payers and about the risk of artificially increasing the CMI through overdiagnosis as well as audit mechanisms to avoid this, and changes in expected mortality and observed mortality. To our knowledge, the lower CMI did not cause any problems with payers, but this is something we are currently tracking. Coding and documentation are constantly audited both internally (by our quality department) and externally (using Inter-Rater Reliability audits and validation), with no noted trend or targeted opportunities. We only include comorbidities that are current, actively monitored/managed, and pertinent to the care of our patients. We have not noted a change in denials, which gives us

confidence we are not now overdiagnosing.

Our observed mortality has also increased. We, like all institutions, experienced the confounding factor of the COVID-19 pandemic, which coincided with the higher observed mortality over the course of the past 2 years. While the observed mortality (indicating sicker patients assuming no worsening of care processes) may partly explain our increased coding complexity, our decreasing mortality index (observed:expected mortality) suggests that our efforts to improve documentation and coding likely reflect improved capture of missed complexity (**Figure**).

We understand the concerns raised by Dr. Kerguelen about potential mis(over)coding. As part of this quality initiative, therefore, we plan long-term evaluations of our processes and metrics to better determine and guide our understanding of the impact of what we have already implemented and future interventions. In fact, we are in the process of analyzing additional interventions and hope to share results from these evaluations soon.

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