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Response to Letter to the Medical Care Editor regarding “Dissecting Leapfrog: How Well Do Leapfrog Safe Practices Score Correlate with Hospital Compare Ratings and Penalties, and How Much Do They Matter?”

Jennifer Meddings, M.D., M.Sc.* and

Assistant Professor of Internal Medicine, Division of General Medicine, University of Michigan
Medical School, Ann Arbor, Michigan

Assistant Professor of Pediatrics and Communicable Diseases, Division of General Pediatrics,
University of Michigan Medical School, Ann Arbor, Michigan

Assistant Professor of Medicine and Research Scientist, Department of Medicine, Veterans
Affairs Ann Arbor Healthcare System, 2800 Plymouth Road, Building 16, Room 430W, Ann Arbor,
MI 48109

Shawna N. Smith, Ph.D.

Senior Statistician, Division of General Medicine, Department of Internal Medicine, University of
Michigan Medical School, Ann Arbor, Michigan

University of Michigan Institute for Social Research, Ann Arbor, Michigan

Letter to the Editor

We thank Ms. Binder and The Leapfrog Group for the response and description of the extensive verification procedures applied to data submitted to the Leapfrog Hospital Survey. We recognize the efforts of The Leapfrog Group in advancing and innovating complex methods for evaluating and comparing hospital safety, and are grateful for their commitment to providing access to their data and transparent methodologies. As researchers invested in improving healthcare quality and safety, we wish to clarify that our motivation for these analyses¹ was indeed to better understand and describe the application of the methodology to generate the publicly-reported Leapfrog Hospital Safety Grades, to help inform future refinements if felt appropriate. It was not our intent to make suggestions to hospitals as to how to impact their grade.

*Corresponding author Phone: 734-936-5216; Fax: 734-936-8944, meddings@umich.edu.

Conflict of interest disclosure statements:

Dr. Meddings is an employee of the University of Michigan and the Veterans Affairs Ann Arbor Healthcare System. Her research has been supported by grants from AHRQ, the VA National Center for Patient Safety, and the Centers for Disease Prevention and Control, as well as contracts with the Health Research & Education Trust (HRET) involving the prevention of CAUTI in the acute-care and long-term care settings that are funded by AHRQ, the Centers for Disease Prevention and Control, and the Centers for Medicare and Medicaid Services. She has reported receiving honoraria from hospitals and professional societies devoted to complication prevention for lectures and teaching related to prevention and value-based purchasing policies involving catheter-associated urinary tract infection and hospital-acquired pressure ulcers.

Dr. Smith is an employee of the University of Michigan, and reports no conflicts of interest to disclose.

We also fully recognize and commend the complexity of the Leapfrog Hospital Safety Grade, incorporating multiple process and outcome measures. Indeed, this complexity is what piqued our interest to study the methodology's application, and investigate the association between Leapfrog's Safe Practices process measures with publicly reported outcomes and penalties (Objective 1). As this is our first analysis involving Leapfrog data, we were actually surprised to learn that hospitals receive a Leapfrog Hospital Safety Grade whether or not they submit the voluntary Leapfrog Hospital Survey, which includes the Safe Practices measures. This prompted our curiosity in how the various grade components contribute to the Grade for hospitals that report compared to hospitals that choose not to report to Leapfrog (Objective 2).

Ms. Binder raises an important concern that misalignment across reporting periods and other factors may be responsible for our ancillary finding of reported differences between primary and secondary data sources for Standardized Infection Ratios (SIRS) for central line-associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI). To clarify the procedures used for aligning data for our analyses involving the CAUTI and CLABSI SIR outcomes, we have provided a Supplemental Appendix. We hope that sharing this document will be useful for The Leapfrog Group and for future researchers working with Leapfrog data.

To summarize these steps, The Leapfrog Methodology Report² for the Spring 2014 Hospital Safety Score indicates two data sources were used for CLABSI and CAUTI SIR outcomes. The 2013 Leapfrog Hospital Survey, with a data collection period from 1/01/2012-06/30/2013, was the Primary Data Source for hospitals that chose to participate. The Secondary Data Source was CMS's Hospital Compare, with a data collection period from 04/01/2012-03/31/2013,³ and was used when hospitals did not report to Leapfrog or did not meet Leapfrog's minimum reporting requirements for these measures. The Leapfrog Hospital Safety Grade dataset includes the CAUTI and CLABSI SIR used for each hospital, as well as an indicator for the source of the data (Leapfrog Hospital Survey or Hospital Compare). As our analyses used CMS Hospital Compare for all Leapfrog hospitals, regardless of Hospital Survey completion, we merged these data with the Hospital Safety Grade dataset. To confirm we had pulled the correct Hospital Compare dataset, we examined the correlation between CAUTI and CLABSI SIRs included from hospitals identified in the Leapfrog dataset as having CMS data with our merged Hospital Compare data, and (after accounting for Leapfrog's trimming) found a perfect correlation ($r=1.00$) (Supplemental Appendix Figures A & B). We then compared the distribution of CLABSI and CAUTI SIRs across data sources for those hospitals identified as having the Leapfrog Hospital Survey as their data source. Distributions for CLABSI SIRs for this subset of hospitals looked very similar ($\text{mean}_{\text{HC}}=0.55$, $\text{SD}_{\text{HC}}=0.49$; $\text{mean}_{\text{LF}}=0.56$, $\text{SD}_{\text{LF}}=0.50$), but unexpectedly, the CAUTI SIRs for these hospitals were systematically lower (i.e., better) in the Leapfrog Hospital Survey data than in the CMS Hospital Compare data ($\text{mean}_{\text{HC}}=1.03$, $\text{SD}_{\text{HC}}=0.82$; $\text{mean}_{\text{LF}}=0.46$, $\text{SD}_{\text{LF}}=0.40$).

While we did not expect to find identical SIRs across the two data sources, given the different reporting periods defined in the methodology report, it was and still is not clear to us why the CAUTI SIRS listed as coming from the Primary Data Source would be markedly

lower than those listed as coming from the Secondary Data Source. In our analyses for Objectives 1 and 2, we opted to use SIR data only from the Secondary Data Source of publicly reported Hospital Compare data to assure all hospitals were reporting for the same time period, as well as consistency across other factors that can impact these SIRS such as the National Healthcare Safety Network (NHSN) definition version used for the reporting period and clinical units reporting. As detailed in the Supplemental Appendix, we also queried whether these observed differences in CAUTI rates between Primary and Secondary Data Sources could be explained by differences in hospitals with unique versus non-unique Medicare Provider IDs. Sensitivity analyses demonstrated that CAUTI SIRS were similarly low for hospitals whether uniquely identified or not in the facility match procedure.

We do not understand the rationale as to why publicly-available Hospital Compare SIR data, currently used as Leapfrog's Secondary Data Source, are not instead used as the Primary Data Source for Hospital Safety Grade, rather than the Leapfrog Hospital Survey, particularly given the immense effort that must be expended to verify the information reported in the Leapfrog Survey with NHSN, the source of the CAUTI and CLABSI SIR data publicly-reported on Hospital Compare.

From our perspective, our study's most important findings (Objectives 1 and 2) involved a different type of self-reported data – the Leapfrog Safe Practices Scores, which are only available in Leapfrog data, and not available in CMS or Hospital Compare data. Specifically, we feel our most important finding was the lack of variability in the self-reported Leapfrog Safe Practices measures, and how this impacts the association with publicly-reported outcomes (Objective 1) and the overall distribution of Leapfrog Hospital Safety Grades incorporating these measures for hospitals that report (Objective 2). More than 50% of participating hospitals reported perfect scores for any one Safe Practice measure, and nearly 1/5 of hospitals reported perfect scores for all eight measures. As our analyses show, not only did this lack of variability preclude meaningful associations with either SIRS or hospital penalties (Objective 1), but for these 'topped out' Safe Practice measures, Leapfrog's 'grading curve'—which for these measures, are built around a distribution with very high means and very small standard deviations—sets up an expectation of perfection in the grading methodology, yielding what appears to be large grade penalties for less-than-perfect self-reported Safe Practices compliance.

In conclusion, it was never our intention to study, assume, or recommend that hospitals "game" the system. Rather, as scientists committed to continual improvement of healthcare quality and safety, our intent was to assess and share our concern that Leapfrog's current methodology may unintentionally assign strong grade penalties for hospitals that report reasonable but less-than-perfect Safe Practices compliance, which may inadvertently discourage hospitals from reporting and learning from their deficiencies.

As noted in our paper, we applaud the vanguard work that Leapfrog has done to initiate public reporting of hospital safety measures, and for continuing to develop and refine new and complex metrics that can be reported to consumers using a friendly letter-grade system. We realize process measures, like the Leapfrog Safe Practices measures, are challenging to develop and collect, and their association with clinical outcomes can be

tenuous and potentially time varying. Given that nearly all of Leapfrog's included Safe Practices measures have reached near-perfect compliance, we encourage The Leapfrog Group to use its expertise and strong relationships with hospitals to develop the next generation of process measures, ideally with stronger links to clinical outcomes, which hospitals could use as tools to self-assess and inform their procedures and resources to improve safety.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

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