Letters

COMMENT & RESPONSE

Evaluating Readmission—Need for More Clarity on Methods

We have several questions about the study by Gupta et al1 that are central to interpreting their evaluation of the Hospital Readmissions Reduction Program (HRRP). The Medicare Hospital Quality Chartbooks,2,3 based on national Medicare data, showed that the 30-day mortality of heart failure (HF) rose annually as early as 2006 (before implementation of the HRRP) before leveling off after 2012. Thus, understanding their sample is important. It would be useful to know how many American Heart Association Get With The Guidelines (GWTG)-HF hospitals were continuously enrolling throughout the study period and how their characteristics compare with the nation’s hospitals. Moreover, the authors included 115,245 HF hospitalizations from 416 hospitals over 9 years1—on average, 2 to 3 hospitalizations per hospital per month. Because many hospitals in the GWTG-HF program, a voluntary registry, are large, this small number per hospital is unexpected. Therefore, it would also be helpful to know the extent to which included GWTG-HF hospitals (and also among those continuously enrolling) were enrolling all of their patients with HF into the registry. Specifically, what percentage of the Medicare fee-for-service patients hospitalized with HF at these GWTG-HF hospitals (as documented in Medicare Provider and Analysis Review files) were entered into the GWTG-HF program during the study period? This information differs from the percentage of GWTG-HF patients matched to Medicare data (also of interest).

Another point relates to the analysis. Because the HRRP was introduced at the hospital level with consideration of random hospital-specific effects, the study also requires random hospital-specific effects in the interrupted time series; policy effects should be determined by averaging over the hospital effects. It is important to report both marginal estimates and between-hospital variation in the different periods.

Finally, the article’s conclusion contrasts with our earlier JAMA publication4 focusing on Medicare patients. While we also found declining readmission rates and modestly rising postdischarge mortality rates for HF across hospitals from 2008 through 2014, we also found that individual hospitals with declining readmission rates were more likely to have, if anything, declining mortality rates. This is contrary to what one would expect if HRRP caused hospitals to reduce readmissions at the expense of increasing mortality. It would be useful to know if this association was also found in the hospitals and patients in the GWTG-HF program. The answers to these queries will assist readers to better interpret the published study and place the comprehensiveness of the results from this voluntary registry in context.

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In Reply We thank Krumholz et al for the interest in our work.1 The authors raise the question of generalizability of our report on the association of the Hospital Readmissions Reduction Program (HRRP) with readmissions and mortality rates in heart failure (HF) by observing that our data are a sample of the overall Medicare population.2 Prior studies have suggested that fee-for-service Medicare patients enrolled in the American Heart Association Get With The Guidelines (GWTG)-HF program appear representative of the overall Medicare HF population. The declining aggregate mortality rates in HF before the HRRP from 2006 to 2010 followed by an increase in mortality rates after 2010 in our report1 is consistent with multiple national fee-for-service Medicare reports.2,3 Published analyses using national fee-for-service Medicare data2 showed a 1.3% absolute increase in 30-day HF mortality rates after vs before the HRRP, which is consistent with the 1.4% absolute increase found in our report,1 suggesting our findings are indeed generalizable to all hospitals exposed to the HRRP.

Data on continuously enrolled hospitals in the GWTG-HF registry during the study period are detailed in the article.1 There

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were 72,814 patients from 119 hospitals who were continuously enrolled during the study period. Further, only the first hospitalization of a given patient was counted as the index hospitalization; any subsequent hospitalizations were considered readmissions. In addition, many index hospitalizations were excluded if patients were younger than 65 years, there was no link between our data and fee-for-service Medicare data, or there was an in-hospital death during the index hospitalization, among others, as detailed in eFigure 1 in the article’s Supplement. 1 For these reasons, the article’s crude estimate of the number of HF hospitalizations per month that each participating hospital may have contributed to the GWTG-HF registry is inaccurate. The results from continuously participating hospital sites were consistent with the overall study population and showed a greater increase in the hazard of 30-day mortality after vs before the HRRP.

Although hospital-level analysis may provide some insights, it is not valid to assess the effect of the HRRP on either readmission or mortality rates by focusing exclusively on hospitals where readmissions declined or analyzing over a limited period of time (monthly intervals in the JAMA publication). 2 This is a critical issue because the influence of the HRRP was universal; thus, its consequences must be evaluated across the entire ecology. Hospital-level analyses using a single correlation coefficient are subject to ecological fallacy. The findings of harm at the patient level may result from a greater number of patients served at hospitals where readmissions declined but mortality rates increased. Further, harm at the patient level may also have resulted from hospitals where misguided attempts to reduce readmissions through restrictions on care and access failed to reduce readmissions but caused increased mortality rates. This question of harm is further amplified by the disproportionate effect of financial penalties applied to the most vulnerable hospitals and patients.

The approach to policy evaluation that our report took by using aggregate patient-level analyses is much more relevant and patient-centric. 2 Krumholz et al suggest that the 1.3% increase in 30-day mortality and approximately 2.2% increase in 90-day mortality in patients with HF after HRRP in their study is modest. 2 We take exception to this description, as the differences found may represent 5000 to 10,000 extra premature deaths per year, an unprecedented degree of possible harm resulting from an untested health care policy leading to consequences that are anything but modest.

Our analyses are not in isolation. There are now multiple studies 1–3 demonstrating that implementation of the HRRP was associated with a substantial and worrisome increase in mortality rates in patients hospitalized with HF. A healthy debate over methods is appropriate but should not be allowed to overshadow the immediate need to revisit this policy and reach a new version that addresses health care resource utilization while also putting patients first.

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CORRECTION
Omitted Conflict of Interest Disclosures: In the Reply Letter titled “Let Us Not Forget the Long-term Safety Concerns of Sacubitril/Valsartan—Reply,” published online March 22, 2017, and in the July 2017 issue of JAMA Cardiology, the author disclosed conflicts of interest that were inadvertently omitted. The Conflict of Interest Disclosures section should read as follows: “The author has completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Dr Packer has received personal fees from Amgen, Admittance, Bayer, Boehringer Ingelheim, Celyad, Daiichi Sankyo, Ferrin, GlaxoSmithKline, Novartis, Relypsa, Sanofi, Takeda, and ZS Pharma.” This article was corrected online.


Error in Results Section of Abstract: In the Original Investigation titled “Premature Cardiac Disease and Death in Women Whose Infant Was Preterm and Small for Gestational Age: A Retrospective Cohort Study,” published online January 31, 2018, there was an error in the abstract. The first sentence of the Results section in the abstract should have appeared as, “Of 710,501 singleton live births, 15,082 mothers (2.1%) were older than age 40 years.” This article was corrected online.


Errors in Abstract, Methods, Discussion, and Figure 1: In the Original Investigation titled “Nonculprit Plaque Characteristics in Patients With Acute Coronary Syndrome Caused by Plaque Erosion vs Plaque Rupture: A 3-Vessel Optical Coherence Tomography Study,” published online February 7, 2018, there were errors in the Abstract, Methods, and Discussion section, as well as Figure 1. In the third paragraph of the Abstract, the abbreviation “ACS” should be replaced with “acute coronary syndrome.” In the sixth sentence of the third paragraph of the Methods section, the abbreviation “MLA” should be deleted. In the first sentence of the Discussion section, there should be a space between “had” and “smaller.” In the penultimate sentence of the sixth paragraph of the Discussion section, the abbreviation “NET” should be replaced with “neutrophil extracellular trap.” Finally, in Figure 1D, the line indicating marker “H” should be horizontal rather than vertical, indicating the middle segment of the right coronary artery. This article was continued online.