

LETTER TO THE EDITOR

Arsenic Exposure in Incident Hemodialysis Patients



To the Editor:

We read with interest the article by Tonelli et al,¹ who prospectively examined plasma concentrations of 25 trace elements in 198 incident hemodialysis patients in Canada. Notably, the group reported that some hemodialysis patients have excessive plasma total arsenic concentrations, and the proportion of patients with plasma arsenic concentrations exceeding the 95th percentile was 9.1% to 9.8%. The observation is important, but we believe that dietary intake of organic arsenic compounds should be excluded before any definite conclusions can be drawn.

Arsenic and its compounds are ubiquitous in nature and occur in both organic and inorganic forms. Inorganic arsenic compounds are highly toxic. Seafood is the largest source of organic arsenic exposure in humans, and the organic arsenic from seafood is considered nontoxic.² Because only total arsenic concentrations were measured in plasma samples of the hemodialysis patients,¹ it is difficult to determine whether the excessive plasma arsenic concentrations could have adverse health effects on these patients. It is common to test biological samples for toxic trace elements in health examinations. Nevertheless, it has been reported that a high arsenic concentration in urine due to dietary seafood intake can sometimes lead to unnecessary chelation therapy.³ To avoid the influence of organic arsenic intake in the samples,⁴ we suggest that all participants refrain from ingesting seafood during the 7 days (or at least 3 days) before sample collection. Otherwise, we recommend arsenic speciation to differentiate between inorganic and organic forms of arsenic.

Tzung-Hai Yen, MD, PhD, Ya-Ching Huang, MSc
Wen-Hung Huang, MD

Article Information

Authors' Affiliations: Chang Gung Memorial Hospital and Chang Gung University, Linkou, Taiwan.

Financial Disclosure: The authors declare that they have no relevant financial interests.

Peer Review: Received September 7, 2017. Accepted September 12, 2017 after editorial review by an Associate Editor and a Deputy Editor.

Publication Information: © 2017 by the National Kidney Foundation, Inc. Originally published online December 1, 2017 with doi 10.1053/j.ajkd.2017.10.003

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Tonelli et al declined to respond.

RESEARCH LETTERS

The Precision of Standardized Hospitalization, Readmission, and Mortality Ratios for Dialysis Facilities



To the Editor:

Standardized ratios are increasingly used as key indexes of quality in “value-based care” and have appeared in a number of health care arenas, such as hospitals.¹ Recently, standardized ratios for hospitalization (SHR), readmission (SRR), and mortality (SMR) have been proposed or adopted to assess other smaller health care entities, among them dialysis facilities (see [Item S1](#) for measure specifications).² Because smaller entities treat fewer patients, calculating standardized ratios for these facilities is inherently based on fewer events, which may result in less statistical power and greater imprecision, as reflected in the variability of score estimates for individual facilities. SHR, SRR, and SMR are used to compare dialysis facilities to guide remuneration and facility selection by patients and physicians and are publically available through the US Centers for Medicare & Medicaid Services (CMS) Dialysis Facility Compare (DFC) website. DFC reports at the facility level both the score and 95% confidence intervals (CIs). The latter enables empirical evaluation of the precision of standardized ratios, although to our knowledge, this has not yet been studied.

Here, we assess the precision of standardized ratios as applied to dialysis facilities to better understand the performance of these metrics within the setting of smaller health care entities. This is a descriptive analysis of the distributional patterns for SHR, SMR, and SRR as reported in the DFC 2015 annual facility file (see [Item S1](#) for detailed methods).³ SHR and SRR were based on the 2014 performance year and SMR was based on 2011 to 2014 performance years.

Within the DFC data set, there were 5,976, 5,933, and 5,879 clinics with SHR, SRR, and SMR scores, respectively (see [Item S1](#) for facility characteristics). Across facilities, median SHR was 0.97; the 10th percentile was 0.64; the 90th percentile was 1.38 ([Fig 1](#)). Median 95% CI width was 1.13: the median lower confidence bound was 0.57 and the median upper confidence bound was 1.73. Thereby, the median upper and lower confidence bounds spanned from below the 10th to above the 90th percentiles of score. Findings were similar for readmissions and mortality.

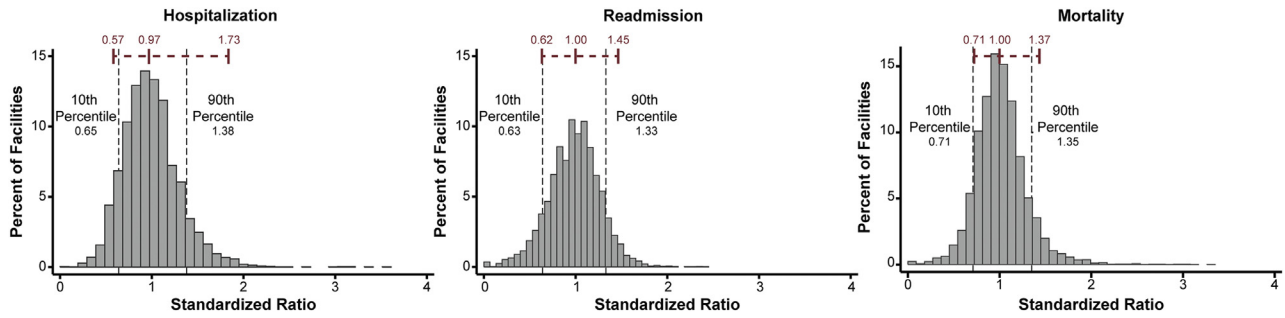


Figure 1. Distribution of (left) SHRs, (center) SRRs, and (right) SMRs. Each histogram represents the distribution of scores across facilities; dashed black vertical lines represent the 10th and 90th percentiles for score; vertical red lines represent (left) median lower confidence bound, (center) median point estimate, and (right) median upper confidence bound.

No (%)	Location of Lower Confidence Bound Relative to Decile of Standardized Ratio									
	1	2	3	4	5	6	7	8	9	10
Standardized Hospitalization Ratio										
1	1 (0.0) ^c									
2	4 (0.1) ^d	0 (0.0) ^c								
3	4 (0.1)	0 (0.0) ^d	0 (0.0) ^c							
4	19 (0.3)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c						
5	17 (0.3)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c					
6	48 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c				
7	85 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c			
8	171 (2.9)	2 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c		
9	570 (9.5) ^b	13 (0.2)	1 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c	
10	2992 (50.1) ^{a,b}	893 (14.9) ^b	404 (6.8)	250 (4.2)	191 (3.2)	130 (2.2)	78 (1.3)	46 (0.8)	38 (0.6) ^d	19 (0.3) ^c
Standardized Readmission Ratio										
1	12 (0.2) ^c									
2	37 (0.6) ^d	0 (0.0) ^c								
3	40 (0.7)	0 (0.0) ^d	0 (0.0) ^c							
4	75 (1.3)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c						
5	122 (2.1)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c					
6	137 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c				
7	283 (4.8)	6 (0.1)	2 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c			
8	349 (5.9)	29 (0.5)	1 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c		
9	630 (10.6) ^b	137 (2.3)	28 (0.5)	7 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c	
10	1532 (25.8) ^{a,b}	969 (16.3) ^b	536 (9.0)	476 (8.0)	231 (3.9)	102 (1.7)	112 (1.9)	44 (0.7)	30 (0.5) ^d	6 (0.1) ^c
Standardized Mortality Ratio										
1	35 (0.6) ^c									
2	37 (0.6) ^d	0 (0.0) ^c								
3	115 (2.0)	0 (0.0) ^d	0 (0.0) ^c							
4	138 (2.3)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c						
5	210 (3.6)	2 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c					
6	239 (4.1)	6 (0.1)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c				
7	356 (6.1)	47 (0.8)	6 (0.1)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c			
8	362 (6.2)	116 (2.0)	26 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c		
9	542 (9.2) ^b	318 (5.4)	183 (3.1)	26 (0.4)	2 (0.0)	1 (0.0)	0 (0.0)	0 (0.0) ^d	0 (0.0) ^c	
10	966 (16.4) ^{a,b}	513 (8.7) ^b	623 (10.6)	313 (5.3)	255 (4.3)	132 (2.2)	103 (1.8)	74 (1.3)	71 (1.2) ^d	62 (1.1) ^c

Figure 2. Distribution of clinics by decile of upper and lower confidence bounds of SHR, SRR, and SMR. Facilities with confidence intervals ^athat span all 10 deciles of score, ^bthat span at least 9 deciles of score, ^cin the same decile of score, and ^din consecutive deciles of score.

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