



FIGURE 1. Percentage distribution of antimicrobial resistance patterns of KPC-*Kp* from inpatients during the study period.

ACKNOWLEDGMENTS

Financial support: No financial support was provided relevant to this article.
Potential conflicts of interest: The author reports no conflicts of interest relevant to this article.

Leandro Reus Rodrigues Perez, PhD^{1,2}

Affiliations: 1. Hospital Mãe de Deus, Porto Alegre, Brazil; 2. Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil.

Address correspondence to Leandro Reus Rodrigues Perez, PhD, Microbiology Unit, Hospital Mãe de Deus, 286, José de Alencar Street, Porto Alegre – RS, 90610-000 Brazil (leandro.reus@gmail.com).

Infect Control Hosp Epidemiol 2017;38:754–755

© 2017 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2017/3806-0023. DOI: 10.1017/ice.2017.51

REFERENCES

- Rodrigues Perez LR. Carbapenem-resistant Enterobacteriaceae: a major prevalence difference due to the high performance of carbapenemase producers when compared to the nonproducers. *Infect Control Hosp Epidemiol* 2015;36:1480–1482.
- Rodrigues Perez LR, Dias CG. Emergence of infections due to a polymyxin B-resistant KPC-2-producing *Klebsiella pneumoniae* in critically ill patients: What is the role of a previous colonization? *Infect Control Hosp Epidemiol* 2016; 37:240–241.
- Perez LR, Rodrigues D, Dias C. Can carbapenem-resistant enterobacteriaceae susceptibility results obtained from surveillance cultures predict the susceptibility of a clinical carbapenem-resistant enterobacteriaceae? *Am J Infect Control* 2016;44:953–955.
- van Duin D, Kaye KS, Neuner EA, Bonomo RA. Carbapenem-resistant Enterobacteriaceae: a review of treatment and outcomes. *Diagn Microbiol Infect Dis* 2013;75:115–120.
- Perez LR. Menacing emergence of fosfomicin resistance among *Klebsiella pneumoniae* carbapenemase-2-producing *K. pneumoniae*

driven by prior use in critically ill patients. *Infect Control Hosp Epidemiol* 2016;37:748–749.

- Giacobbe DR, Del Bono V, Trecarichi EM, et al. Risk factors for bloodstream infections due to colistin-resistant KPC-producing *Klebsiella pneumoniae*: results from a multicenter case-control-control study. *Clin Microbiol Infect* 2015;21:1106.e1–1106.e8.

Reliability of Surveillance for Ventilator-Associated Events and Pneumonia; Methodological and Statistical Issues

To the Editor— I was interested to read the paper by Kerlin et al¹ published in the February 2017 issue of the *Infection Control and Hospital Epidemiology*.¹ The authors compared interrater reliabilities for ventilator-associated event (VAE) surveillance, traditional ventilator-associated pneumonia (VAP) surveillance, and clinical diagnosis of VAP by intensivists.¹ In total, 150 charts from intensive care units (ICUs) within 5 hospitals, including all VAEs and traditionally defined VAPs identified during the primary study and randomly selected charts of patients without VAEs or VAPs, were selected for review.¹ All charts independently reviewed by 2 research assistants (RAs) for VAEs, 2 hospital infection preventionists (IPs) for traditionally defined VAP, and 2 intensivists for any episodes of pulmonary deterioration.¹

Based on their results, in total, 93–96 VAEs were identified by RAs; 31–49 VAPs were identified by IPs, and 29–35 VAPs

were diagnosed by intensivists. Interrater reliability between RAs for VAEs was high (κ , 0.71).¹ The clinical correlation between VAE surveillance and intensivists' clinical assessments was poor.

It is crucial to know that using κ value to assess agreement is a common mistake in reproducibility analysis. There are 2 important weaknesses of using a κ value to assess agreement of a qualitative variable: First, it depends upon the prevalence in each category, which means that it is possible to have a different κ value with the same percentage for both concordant and discordant cells! The κ value also depends upon the number of categories.^{2–5} In such situations, a weighted κ is the preferable test because it gives an unbiased result. Moreover, for reliability analysis, an individual-based approach should be applied instead of a global average, which is usually applied for assessing the validity (accuracy) of a test.^{2–5} Finally, reproducibility (ie, precision, reliability, repeatability, calibration) and validity (ie, accuracy, discrimination) are completely different methodological issues that should be assessed using appropriate tests.^{6–10} It is crucial to know that to assess validity, sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), the most appropriate tests are likelihood ratio positive and likelihood ratio negative as well as diagnostic accuracy and odds ratio.^{6–10}

Kerlin et al concluded that prospective surveillance using VAE criteria is more reliable than traditional VAP surveillance and clinical VAP diagnosis; the correlation between VAEs and clinically recognized pulmonary deterioration is poor. Such a conclusion may be misleading due to the inappropriate use of a statistical test to assess reliability and validity.

ACKNOWLEDGMENTS

Financial support: No financial support was provided relevant to this article.

Potential conflicts of interest: All authors report no conflicts of interest relevant to this article.

Siamak Sabour, MD, MSc, DSc, PhD^{1,2}

Affiliations: 1. Safety Promotion and Injury Prevention Research Center, Shahid Beheshti University of Medical Sciences, Tehran, I.R. Iran; 2. Department of Clinical Epidemiology, School of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Address correspondence to Siamak Sabour, Safety Promotion and Injury Prevention Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran (s.sabour@sbmu.ac.ir).

Infect Control Hosp Epidemiol 2017;38:755–756

© 2017 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2017/3806-0024. DOI: 10.1017/ice.2017.46

REFERENCES

1. Kerlin MP, Trick WE, Anderson DJ, et al. Interrater reliability of surveillance for ventilator-associated events and pneumonia. *Infect Control Hosp Epidemiol* 2017;38:172–178.
2. Sabour S. Reproducibility of circulating endothelial cell enumeration and activation: a methodological issue. *Biomark Med* 2016;10:1215.

3. Sabour S. Reliability assurance of EML4-ALK rearrangement detection in non-small cell lung cancer: a methodological and statistical issue. *J Thorac Oncol* 2016;11:e92–e93.
4. Sabour S, Li ZY. Reproducibility of image-based computational models of intracranial aneurysm; methodological issue. *Biomed Eng Online* 2016;15:109.
5. Sabour S. Adherence to guidelines strongly improves reproducibility of brachial artery flow-mediated dilation. Common mistakes and methodological issue. *Atherosclerosis* 2016;251:490–491.
6. Sabour S, Farzaneh F, Peymani P. Evaluation of the sensitivity and reliability of primary rainbow trout hepatocyte vitellogenin expression as a screening assay for estrogen mimics: methodological issues. *Aquat Toxicol* 2015;164:175–176.
7. Sabour S. Validity and reliability of the new Canadian Nutrition Screening Tool in the 'real-world' hospital setting: methodological issues. *Eur J Clin Nutr* 2015;69:864.
8. Sabour S. Validity and reliability of the robotic objective structured assessment of technical skills. *Obstet Gynecol* 2014;124:839.
9. Sabour S. Validity and reliability of the 13C-methionine breath test for the detection of moderate hyperhomocysteinemia in Mexican adults; statistical issues in validity and reliability analysis. *Clin Chem Lab Med* 2014;52:e295–e296.
10. Sabour S. Accuracy and reliability of linear measurements using 3-dimensional computed tomographic imaging software for Le Fort I osteotomy: common mistakes. *Br J Oral Maxillofac Surg* 2014;52:872.

Improved Outcomes When Antibiotic Prescribing Guidelines Are Followed by Healthcare Providers: A Colombian Example to Encourage Adherence in Hospital Settings

To the Editor—Over the past decade, the prevalence of antibiotic resistance has increased alarmingly worldwide, prompting the General Assembly of the United Nations to label this problem as the greatest threat to human health, sustainable development, and security. Latin American countries are largely affected by antibiotic resistance, which has not only persisted but spread, mainly due to mobile genetic elements carrying several resistance determinants.¹ Antimicrobial stewardship (AMS) and infection prevention are complementary, multidisciplinary approaches for curbing bacterial resistance.²

In Colombia, AMS programs have had a positive impact on optimizing antibiotic use, reducing resistance trends and even saving healthcare costs.^{2–4} Locally developed antibiotic guidelines, based on epidemiological surveillance and clinical studies, assist healthcare providers in clinical decision making, thereby mitigating the overuse and misuse of antibiotics. To the best of our knowledge, no studies have addressed the degree to which healthcare providers in Colombia adhere to antibiotic guidelines when prescribing antibiotics to treat existing infectious disease.