Reply to Livorsi and Eckerle

To the Editor—We thank Livorsi and Eckerle [1] for their comments on our meta-analysis and for sharing their local microbiology and outcomes data for healthcare associated pneumonia (HCAP) [1]. Their data illustrate several key points that arose from our meta-analysis and previous work [2, 3]. The first is the importance of knowing the local epidemiologic and microbiologic features of pneumonia rather than relying on a universal HCAP definition. Even allowing for the difficulties in obtaining a positive microbiologic diagnosis, their frequency of Enterobacteriaceae (38%), *Pseudomonas aeruginosa* (15%), and methicillin-resistant *Staphylococcus aureus* (MRSA; 12%) are extremely high, and therefore their local ecology is clearly different from that for recent European cohorts with reported rates of 2.2%–4.8% for *P. aeruginosa*, 1.6%–2.4% for MRSA, and 6.7%–7.2% for Enterobacteriaceae [2–5]. Even within the same country, such as the United States, very different rates of multidrug-resistant pathogens (MDR) are being reported. In their analysis, Livorsi and Eckerle do not report the rates of potentially resistant pathogens in their community-acquired pneumonia (CAP) population. Another key finding in our meta-analysis was that several studies reporting high rates of MDR pathogens in patients with HCAP also reported high rates in those with CAP [6]. A lack of discrimination between the 2 groups suggests the need for a better way of identifying patients at risk of MDR pathogens [7].

Ultimately, as Livorsi and Eckerle [1] point out, it is patient outcomes that matter. Use of broad-spectrum “HCAP antibiotics” to cover MDR pathogens in a high proportion of patients presenting with pneumonia runs the risk of driving further antibiotic resistance and complications such as *Clostridium difficile* infection [8]. This cannot be justified without clear evidence that this approach is beneficial. In our meta-analysis we could not clearly demonstrate that HCAP was independently associated with worse outcome [2]. To date, to our knowledge, there are no randomized controlled trials and no observational data that clearly demonstrate a benefit of broad-spectrum HCAP therapy. The largest analysis, by Attridge and colleagues [9], found that receiving “guideline concordant” HCAP therapy was associated with increased mortality rates. Although the authors acknowledge that the association is probably partially the result of residual confounding, this is not a firm evidence base on which to
recommend the widespread use of broad-spectrum antibiotic therapy for HCAP.

We agree with Livorsi and Eckerle [1] that it is time to move beyond describing the microbiologic features of CAP and HCAP and start considering whether HCAP recommendations benefit patient outcomes and considering the potential harms of excessive broad-spectrum antibiotic treatment.

**Note**

*Potential conflicts of interest.* All authors: No potential conflicts of interest.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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Clinical Infectious Diseases 2014;59(4):610–1

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DOI: 10.1093/cid/ciu335