0920-0852 – Attachment M

The article is entitled "*Multistate Point-Prevalence Survey of Health Care–Associated Infections*," by Shelley S. Magill, M.D., Ph.D., Jonathan R. Edwards, M.Stat., Wendy Bamberg, M.D., Zintars G. Beldavs, M.S., Ghinwa Dumyati, M.D., Marion A. Kainer, M.B., B.S., M.P.H., Ruth Lynfield, M.D., Meghan Maloney, M.P.H., Laura McAllister-Hollod, M.P.H., Joelle Nadle, M.P.H., Susan M. Ray, M.D., Deborah L. Thompson, M.D., M.S.P.H., Lucy E. Wilson, M.D., and Scott K. Fridkin, M.D., published in the N Engl J Med 2014; 370:1198-1208 explains how CDC uses the results of this study to generate estimates of the national burden of health care–associated infections in acute care hospitals were generated through the use of a modeling process that accounted for selected predictors of infection prevalence, including age and length of stay, and application of the results of this modeling to the NIS, a nationally representative sample of U.S. community-hospital stays.

As described in Magill 2014, the method that is used to generate estimates of the national burden of health care–associated infections is described below.

We converted infection prevalence to incidence using the formula of Rhame and Sudderth[33]: $I=P\times[LA\div(LN-INT)]$, where I denotes incidence, P prevalence, LA the mean length of hospitalization for all patients, LN the mean length of hospitalization for patients who acquired one or more health care–associated infections, and INT the mean interval between admission and the onset of the first such infection. Numbers of patients with health care–associated infections were obtained by multiplying infection incidence by numbers of U.S. hospital discharges, obtained from the 2010 Nationwide Inpatient Sample (NIS).[34] This database of hospitalizations from a sample of U.S. community hospitals was developed as part of the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality; discharge weighting allows national estimates to be generated from the sample.

We sought to improve the precision of the burden-estimation process by performing log-binomial regression modeling to identify factors significantly associated with the prevalence of health care–associated infections. Through a process described in the Supplementary Appendix, the results of regression modeling were used to create multiple strata based on patient age and a proxy measure of the length of the hospital stay. Within each stratum, the predicted prevalence of health care–associated infections was converted to incidence with the use of the median length of the hospital stay for surveyed patients for whom such information was available (LA in the formula of Rhame and Sudderth), the median length of hospital stay for patients with health care–associated infections (LN), and the median interval from admission to the onset of the first health care–associated infection (INT). Median rather than mean values were used owing to a skewed distribution. The incidence in each stratum of age and length of stay was multiplied by the total number of U.S. discharges in that stratum (with the use of weighted discharge data from the NIS), under the assumption that each discharge represented a unique patient, to get stratum-specific numbers of patients with health care–associated infections. These stratum-specific numbers were summed to obtain an estimate of the total number of inpatients with health care–associated infections in U.S. acute care hospitals in 2011. Because our estimates of the median length of the hospital stay for all patients were based on data from patients receiving antimicrobial therapy, who may have had a longer median length of stay than patients not receiving such therapy, we also performed the burden-estimation process using data from the

NIS for the median length of the hospital stay for all patients in the formula of Rhame and Sudderth.

Burden estimates for major types of health care–associated infection were generated by multiplying the proportion of surveyed patients with each infection type by the estimated total number of patients with health care–associated infections. The numbers of each major type of infection were summed to obtain an estimate of the total number of inpatient health care–associated infections in U.S. acute care hospitals in 2011.