



Analysis and Recommendations on the NHSN *Clostridioides difficile* Outcome

Date: November 2018

Preface

The Healthcare Infection Control Practices Advisory Committee (HICPAC) is a federal advisory committee chartered to provide advice and guidance to the Centers for Disease Control and Prevention (CDC) and the Secretary of the Department of Health and Human Services (HHS) regarding the practice of infection control and strategies for surveillance, prevention, and control of healthcare-associated infections, antimicrobial resistance and related events in United States healthcare settings. At the July 2017 HICPAC meeting, CDC asked HICPAC for input on topics related to the National Healthcare Safety Network (NHSN), including, but not limited to:

- Data access policies and practices
- Data validation
- Quality measurement priorities and methods
- Data use for hospital-acquired infection (HAI) prevention at the facility, local, state, and national levels
- Informatics/information technology (IT) advances and surveillance improvements, including data security and IT platforms

HICPAC formed a workgroup to develop this input. The NHSN Workgroup provided updates and obtained HICPAC feedback at the May 2018 and November 2018 HICPAC Meetings. At the November 2018 meeting, HICPAC voted to finalize the recommendations on the NHSN *Clostridioides difficile* Outcome.¹

Background

NHSN is the most widely used secure, internet-based HAI surveillance system in the United States. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate healthcare-associated infections. Additionally, facilities that participate in reporting programs operated by the Centers for Medicare and Medicaid (CMS) are required to submit HAI outcome measures into NHSN, and CMS utilizes *Clostridioides difficile* infection (CDI) outcomes along with other HAI and quality metrics to determine hospital reimbursement levels as part of both the Value-Based Purchasing and Hospital-Acquired Conditions programs based on hospitals' relative rankings. CMS penalties for hospitals that fall into the lowest quartile of performance can translate into losses of millions of dollars for many healthcare facilities. CDI is a major cause of antibiotic-associated diarrhea and colitis. It contributes significantly to patient morbidity and mortality. CDI is a common cause of healthcare-associated infection. CDI rates have not been decreasing in contrast to other healthcare-associated infections.²

Optimal risk adjustment should yield very similar CDI rates for a given hospital independent of *C. difficile* testing method; i.e. very similar standardized Infection ratios (SIRs) should be obtained independent of which *C. difficile* testing method is used by hospitals. Recent peer-review publications have demonstrated that despite recent modifications in the NHSN CDI risk adjustment model to account for the impact of different CDI testing methods, *C. difficile* LabID event SIRs for many hospitals continue to be substantially impacted by the choice of laboratory testing methods.^{3,4} Although the studies demonstrating this problem had some small methodological limitations, they demonstrated that hospitals using nucleic acid amplification tests (NAAT) would have higher SIRs than if they performed enzyme immunoassay testing (EIA). Because of the potential financial impact tied to relative CDI outcome performance across healthcare facilities, a number of hospitals have altered their *C.*

Analysis and Recommendations on the NHSN *Clostridioides difficile* Outcome

difficile testing strategies with the main intent of lowering their CDI SIRs. The workgroup identified this as a major problem that can result in increased laboratory testing costs and can potentially impact hospital-specific CMS reimbursement.

Recommendations

1. Because there is evidence that even with recent modifications, the current CDI risk adjustment model does not optimally account for the impact of specific CDI testing methods used by individual hospitals on hospitals' CDI SIRs, we strongly recommend that NHSN evaluate options for revising the *C. difficile* LabID event reporting and/or risk adjustment parameters. Options to consider include, but are not limited to:
 - Requesting that hospitals report the specific type of positive test result (i.e., positive toxin EIA, positive NAAT) for each LabID case to improve risk adjustment
 - Generating SIRs that compare only hospitals using the same testing strategies, similar to how NICU BSI SIRs are stratified by birthweight, such that NAAT only hospitals are compared only to NAAT only hospitals and so on
 - Allowing hospitals that perform multi-step testing that includes both toxin EIA and NAAT to limit LabID reporting to just toxin-positive cases to minimize the impact of testing order
 - Recruiting a network of representative hospitals across the U.S. to split stool samples and perform EIA testing on half and NAAT testing on the other half of the stool specimen to allow the calculation of parameter estimates that would yield the closest SIRs independent of testing method. The results from these hospitals would help guide better parameter estimates for the whole NSHN network

References

1. Centers for Disease Control and Prevention. [Surveillance for C. difficile, MRSA, and other Drug-resistant Infections](https://www.cdc.gov/nhsn/acute-care-hospital/cdiff-mrsa/index.html). December 2018. [https://www.cdc.gov/nhsn/acute-care-hospital/cdiff-mrsa/index.html. Accessed 07 September 2018]
2. Centers for Disease Control and Prevention. [Clostridioides difficile Infection](https://www.cdc.gov/hai/organisms/cdiff/cdiff_infect.html). January 2019. [https://www.cdc.gov/hai/organisms/cdiff/cdiff_infect.html. Accessed 07 September 2018]
3. Marra AR, Edmond MB, Ford BA, Herwaldt LA, Algwizani AR, Diekema DJ . Impact of 2018 Changes in National Healthcare Safety Network Surveillance for Clostridium difficile Laboratory-Identified Event Reporting. *Infection Control and Hospital Epidemiology*. 2018 Jul;39(7):886-888.
4. Marra AR, Edmond MB, Ford BA, Herwaldt LA, Algwizani AR, Diekema DJ. Failure of Risk-Adjustment by Test Method for *C. difficile* Laboratory-Identified Event Reporting. *Infection Control and Hospital Epidemiology*. 2017 Jan;38(1):109-111.

Suggested Citation

Healthcare Infection Control Practices Advisory Committee. Recommendations on the National Healthcare Safety Network *Clostridioides difficile* Outcome – the Healthcare Infection Control Practices Advisory Committee (HICPAC) 2018.

Contributors

2018 HICPAC Members, *ex officio* Members, and Liaison Representatives

HICPAC NHSN Workgroup Members

Deborah S. Yokoe, MD, MPH, University of California, San Francisco (Co-lead); Anthony Harris, MD, MPH, University of Maryland (Co-lead); Hilary M. Babcock, MD, MPH, Washington University School of Medicine; Andrea Benin, MD, Yale-New Haven Children's Hospital; Vickie M. Brown, RN, MPH, Infection Prevention Consultant; Yvonne Chow, MPP, Health Resources and Services Administration (HRSA); Sarah Duvall, MPH, CPHQ, Healthcare Association of New York State (HANYS); Tricia Elliot, MBA, CPHQ, The Joint Commission (TJC);

Centers for Disease Control and Prevention

National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)
Division of Healthcare Quality Promotion (DHQP)

Date: November 2018

Page 2 of 3

Analysis and Recommendations on the NHSN *Clostridioides difficile* Outcome

Patti Grant, Association of Professionals of Infection Control and Epidemiology, Inc. (APIC); Michael D. Howell, MD MPH, Google; W. Charles Huskins, MD, MSc, Mayo Clinic College of Medicine; Lynn Janssen MS, CIC, CPHQ, California Department of Public Health; Marion Kainer, MD, MPH, Council of State and Territorial Epidemiologists (CSTE); Lisa L. Maragakis, MD, MPH, Johns Hopkins University School of Medicine; Daniel Schwartz, MD, MBA Center for Medicare & Medicaid Services (CMS); Connie J. Steed, RN, CIC, MSN, Greenville Health Systems; Kaede Ota Sullivan, MD, Temple University; Tom R. Talbot, MD, MPH, Vanderbilt University; Mary Therriault, MS, RN, Healthcare Association of New York State (HANYS); Judy Trawick, Health Resources and Service Administration (HRSA); Margaret VanAmringe, MHS, the Joint Commission

Acknowledgements

Michael Bell, MD, Designated Federal Officer (DFO); Koo-Whang Chung, MPH; Kendra Cox, MA; and Erin Stone, MS, Committee Management Specialist (CMS); the Division of Healthcare Quality Promotion (DHQP), Centers for Disease Control and Prevention