Guidance for the Implementation of the National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance (AUR) Module

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Why are we doing this?

Antimicrobial resistance (AR) is a significant and rapidly growing public health threat in Los Angeles County (LAC) and nationwide. AR organisms are more difficult and costly to treat, and contribute to a growing number of preventable deaths each year. AR is directly driven by the overuse and misuse of antimicrobials.

The Centers for Disease Control and Prevention (CDC) outlined the impact of AR threats in their 2013 AR Threat Report[1]. The White House subsequently released its National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB)[2] in 2015.

The CDC and LAC Department of Public Health (DPH) is working to control these AR threats via multiple avenues. One of these interventions is monitoring and tracking of antimicrobial use via the CDC's National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance (AUR) Module[3].

Who is this for?

This guide is intended for healthcare staff that are involved in tracking, reporting, and evaluating HAI and AU data within their respective healthcare facilities. This includes, but is not limited to, pharmacists, hospital administrators, infection preventionists (IPs), information technologists (IT), quality improvement personnel, and physicians.

At this time, only general acute care hospitals, long-term acute care hospitals, inpatient rehabilitation facilities, oncology hospitals, and critical access hospitals already enrolled in NHSN may enroll in the AUR Module.

What Is the Antimicrobial Use and Resistance Module?

Introduction

The AUR Module allows hospitals to electronically report and analyze data using one or both of the following options at any given time:
- AU Option: Used to assess use of specific antimicrobial agents.
- AR Option: Used to assess the proportion of patient isolates that test resistant to specific antimicrobial agents.

More detailed information about the AUR Module Technical and Reporting Requirements can be found in the **Resources** section.

Technical Requirements

To participate in either option, facility staff must coordinate with their laboratory and/or pharmacy information software providers to configure a system that will collect the necessary data and generate the required file format(s) to be uploaded into NHSN.

For AU data submission, hospitals must have the following two elements in place:
1. Electronic Medication Administration Record (eMAR), or Bar Coding Medication Administration (BCMA) systems
2. Ability to collect and package data using HL7 standardized format[4]: Clinical Document Architecture.

For AR data submission, hospitals must have the following three elements in place:
1. Laboratory Information System (LIS)
2. Admission Discharge Transfer (ADT) System
3. Ability to collect and package data using HL7 standardized format[4]: Clinical Document Architecture.

Data Collection and Submission Methods

In the AU Option, hospitals will submit and track the following data elements, gathered by both location-specific and facility-wide inpatient usage:

- Numerator:
  - Antimicrobial days (days of therapy) for 89 antimicrobials of interest, sub-stratified by route of administration
- Denominator:
  - Days Present
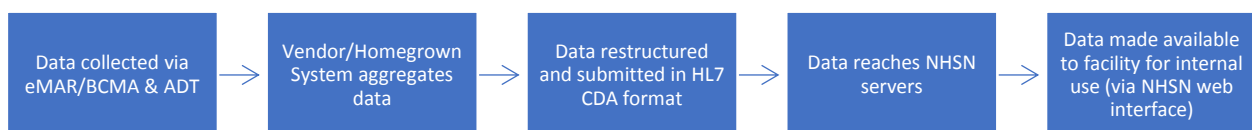 - Patient Admissions

In the AR Option, hospitals will submit and track the following data elements, gathered facility-wide only:

- Numerator:
  - Patient-level susceptibility results for 19 specific organisms
    - This includes patient demographic, organism, and susceptibility data.
- Denominator:
  - Patient Days
  - Patient Admissions

A complete list of data fields (including the 89 antimicrobials and 19 organisms that are being tracked in this module) can be found in the NHSN AUR Module Protocol (**Resources**).

Hospitals may either manually submit AU data on a monthly basis, or may work with their vendor and/or IT department to develop a way to automatically submit the data to NHSN. Manual data entry is not allowed in the AUR Module, as all data is automatically pulled from electronic databases.

The following figure demonstrates how the data flows from the EHR into NHSN:

Data collected via eMAR/BCMA & ADT → Vendor/Homegrown System aggregates data → Data restructured and submitted in HL7 CDA format → Data reaches NHSN servers → Data made available to facility for internal use (via NHSN web interface)

Data Analyses of Interest

These measures are integral in evaluating impacts of a facility's antimicrobial stewardship (AS) efforts. In the AU Option, tracking AU over time allows facilities to evaluate the short-term progress toward AS goals using the number of antimicrobial days or the Standardized Antimicrobial Administration Ratio (SAAR) over time. The SAAR is a metric developed by CDC to analyze and report antimicrobial use data in summary form. A high SAAR that achieves statistical significance may indicate excessive antibacterial use. The SAARs are generated for specific antimicrobial groupings, each of which can serve as a high value target or high level indicator for antimicrobial stewardship programs. This allows for risk-adjusted comparison of antimicrobial use between units in a facility, between different facilities, and to regional and national aggregates.

In addition, facilities may generate the following using the AU Option:
- Line lists: these are helpful in validating any data that is submitted.
- Rate tables: these can be modified to demonstrate antimicrobial use by location and/or antimicrobial class over time to evaluate the impact of any AS efforts.
- Pie charts and bar charts: these provide visualizations that demonstrate antimicrobial use within different units.

In the AR option, looking at the proportion of resistant isolates can aid in clinical decision-making, and helps assess long-term impacts of AS efforts.

Facilities may generate the following output options using the AR Option:
- Line lists: these are helpful in validating any data that is submitted.
- Facility-wide antibiogram: these can be pulled on a regular basis to assess facility prevalence of AR over time.

Benefits of Reporting

The AUR Module will help facilities standardize and centralize reporting of antibiotic use and resistance data, and gives hospitals a better picture of problem areas within their facility to target interventions. Since AU has been correlated with increased incidence of CDI[5,6,7], AS programs can overlay their facility AU data with their CDI data to evaluate areas of high antimicrobial use and develop antimicrobial specific interventions.

Hospitals are already required to report certain HAIs and healthcare personnel influenza immunization to the Centers for Medicaid Services (CMS) for reimbursement. In June 2016, CMS proposed a new rule that would require hospitals to report AU and/or AR data[8]. Hospitals will be able to meet the Meaningful Use Stage 3 "certified technology" requirement[9] and the Joint Commission's Antimicrobial Stewardship Standard to monitor antibiotic prescribing patterns[10].

At the time of writing this guidance, there are 305 hospitals in the United States reporting AU data, and 40 reporting AR data into the AUR Module. Reporting your AU and/or AR data to NHSN would put your facility or healthcare system at the cutting-edge of AR surveillance and prevention efforts across the nation.

How Can LACDPH Help You?

Current Activities

Surveillance of HAIs and AR is a core activity of LACDPH in responding to public health threats in a timely manner for the safety of LAC residents. LACDPH has begun providing a regional summary of NHSN data for healthcare providers, administrators, and customers in LAC to gain a better understanding of the regional epidemiology of HAIs and AR in their communities. LACDPH hopes to continue collecting surveillance data, particularly AU and AR data, to better inform our public health response, and to provide facilities with the information and resources needed to control HAIs and AR.

Funding Assistance

LACDPH has received funds from the CDC to offer one-time financial assistance to hospitals that are committed to implementing the AU and/or AR options, and reporting this data to NHSN. These funds are meant to offset the costs of developing a home-grown data infrastructure, purchasing add-on software or updating your existing EHR, and/or hiring an IT specialist.

Technical Assistance

The California Department of Public Health (CDPH) HAI Program is offering interested hospitals an opportunity to receive NHSN AU reporting implementation technical assistance. The HAI Program is working with the Lantana Consulting Group, health informatics consultants with expertise in hospital system inter-operability, health data standards, and data exchange using NHSN Clinical Document Architecture. At no cost to participating hospitals, Lantana will provide:

- An onsite technical assessment of your hospital's IT infrastructure and AU reporting-readiness, including communication with your hospital's leadership and vendors.
- A step-by-step AU implementation plan, customized to your hospital's needs.
- Ongoing technical support as your hospital works toward AU reporting.
- A collaborative that provides a forum to discuss progress and barriers to implementation with other participating facilities.

In addition, LACDPH has contacts at hospitals who have already begun reporting into the AUR Module. We can obtain feedback and guidance from these hospitals as needed.

Requirements for Receiving Funding Assistance

To be considered for this financial support, facilities must meet these requirements:

1. The AU and/or AR Option technical requirements as outlined on page 3.

2. Hospital leadership support (defined as providing staff time and/or funding to directly support these activities) for reporting AU and/or AR data to the NHSN AUR Module.

3. A commitment by hospital leadership to prioritize this reporting project to ensure information technology resources are adequate and available to implement reporting within 12 months of receiving the financial support.

4. Once implemented, AUR Module reporting should be continued. Adherence to NHSN policies and procedures is expected.

5. In return for this financial assistance, LACDPH requires that the hospital (or healthcare system) confer data rights to LACDPH NHSN group. LACDPH will keep this data secure and confidential.

Contact Information

If you have any questions, please contact {insert name and email}.

RESOURCES

For more information about NHSN, visit:
http://www.cdc.gov/nhsn/index.html

For more information about the NHSN AUR Module, visit:
- Surveillance for Antimicrobial Use and Antimicrobial Resistance Options (including training, protocols, data collection forms, supporting material, and analysis resources): http://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html
- NHSN AUR Module Protocol: https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf
- Introduction to the NHSN AUR Module (January 2017): https://www.cdc.gov/nhsn/pdfs/training/aur/aur-training.pdf
- Using the CDC's NHSN AU Module to Track and Report AU Data (October 2015, CDPH): https://www.cdph.ca.gov/programs/hai/Documents/5b_ASPCollaborativeUsingNHSN_AU_CDPH102115.pdf

To learn about which vendors are participating in the AUR Module through direct reporting, visit:
http://www.sidp.org/aurvendors
please note that this is a list of self-reported vendors

For more information about conferring rights to the LACDPH NHSN group, contact one of the following: {Insert name and email}

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