# 2015 Healthcare-Associated Infections and Antimicrobial Use Prevalence Survey

*Centers for Disease Control and Prevention (CDC) and Emerging Infections Programs (EIP)*

## Project Overview

**What is the Healthcare-Associated Infections and Antimicrobial Use Prevalence Survey project?**

- It is a one-day survey of healthcare-associated infections (HAIs) and antimicrobial use in a sample of U.S. acute care general and general children's hospitals.
- CDC and the EIP conducted the first full-scale U.S. HAI and antimicrobial use prevalence survey in 2011. More than 180 hospitals in 10 states participated, and over 11,000 patients were surveyed.
- The survey provides critical information on the burden and types of HAIs affecting patients in U.S. hospitals and on the use of antimicrobial drugs.

**What did the 2011 survey accomplish? Why conduct another survey in 2015?**

- The 2011 survey redefined the burden of HAIs and showed how antibiotics are being used in U.S. hospitals. Survey results garnered national and international attention, and were published in the *New England Journal of Medicine* (http://www.nejm.org/doi/full/10.1056/NEJMoa1306801) and *JAMA* (http://jama.jamanetwork.com/article.aspx?articleid=1911328).
- Survey results influenced the creation of the "National Strategy for Combating Antibiotic-Resistant Bacteria" and the President's Council of Advisors on Science and Technology report on "Combating Antibiotic Resistance":
  - Survey data were used to generate national burden estimates for antibiotic-resistant infections in the CDC's report on "Antimicrobial Resistance Threats in the United States, 2013" (http://www.cdc.gov/drugresistance/threat-report-2013/index.html), for the first time putting this burden in context for the public and for policy makers.
  - The survey provided national data on hospital antimicrobial drug use to highlight the potential for improving prescribing in U.S. hospitals (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6309a4.htm) and justify the need for policy changes outlined in the National Strategy to expand antibiotic stewardship programs to all U.S. hospitals.
- Conducting another survey in 2015 is important to understand how HAIs and antimicrobial use are changing over time in hospitals as more prevention and stewardship activities are implemented. It also provides the opportunity to gather information that wasn't collected in the 2011 survey. For example, in this new survey we will collect more data about the quality of antimicrobial drug prescribing.

**Doesn't the CDC's National Healthcare Safety Network (NHSN) provide similar information?**

- The prevalence survey is designed to complement data reported to the NHSN; many HAIs detected in the prevalence survey are not routinely reported to NHSN or other surveillance systems.
- There are no other CDC surveillance systems collecting patient-level information on the reasons for antimicrobial use in acute care hospitals.

**What is the Emerging Infections Program (EIP)?**

- EIP is a network of 10 state health departments (CA, CO, CT, GA, MD, MN, NM, NY, OR, TN) and their collaborators. EIP works with the CDC on a variety of infectious disease surveillance and prevention-oriented projects, including this survey effort (go to http://www.cdc.gov/hai/eip/index.html for more information).

**What are the main objectives of the 2015 survey?**

- Estimate HAI prevalence in a large sample of U.S. acute care inpatients;
- Determine the distribution of HAIs by pathogen and major infection site across the spectrum of hospital locations;
- Estimate the prevalence and describe the rationale for antimicrobial use in a large sample of U.S. acute care inpatients.

*CDC/EIP 2015 Healthcare-Associated Infections and Antimicrobial Use Prevalence Survey Overview*

**What hospitals are being asked to participate in the 2015 survey?**

- Each EIP site will engage up to 25 acute care (including children's) hospitals. We'd like all hospitals that participated in the 2011 survey to participate in the 2015 survey. Participation is voluntary.
- Hospitals that are selected are not required to participate, but participation will help maintain the quality of the survey methods and results. Hospitals do not need to participate in NHSN to join the survey.

**What is the role of the hospital Infection Preventionist and other hospital personnel?**

- Each hospital will be asked to identify a survey team made up of 1 or more staff members. This team is called the "Primary Team," or PT. The PT Leader should be an Infection Preventionist or Hospital Epidemiologist, if possible. EIP staff will work with hospitals that do not have an Infection Preventionist available to identify another qualified individual to fill this role. Other PT members are chosen by the PT Leader.
- The PT will work with EIP staff to select a survey date, which can be any weekday (Monday-Friday) from May 1 through September 11, 2015.
- Before the survey date, the PT Leader (or designee) will be asked to complete a questionnaire that asks about hospital bed size, staffing, and hospital infection control and antimicrobial use policies and practices.
- A few weeks before the survey date, the PT will provide information about the hospital's acute care inpatient units and bed numbers to the EIP staff.
- On the survey date, the PT will obtain the morning inpatient census; this will be used to select a random sample of patients to survey. The EIP staff will do most of the work to generate this random sample.
- Data collected by PTs will include patient demographics; central line, urinary catheter, and ventilator use; height and weight; and whether the patient is on antimicrobials at the time of the survey.
- Data collection by the PT will be limited to the day of the survey. EIP staff will later collect detailed information from medical records about HAIs and antimicrobial use.
- If you have concerns about PT activities or time commitment, please discuss these with your EIP contact to explore options that may allow your hospital to participate.

**How will the data be kept confidential?**

- CDC and EIP sites will know the identities of the hospitals that are selected to participate and the identities of hospitals that actually participate in the survey.
- Data will be collected from existing medical records only. There is no direct interaction with patients.
- No patient identifiers, other than selected dates (such as admission and discharge date) will be shared with the CDC. However, the PT will need to collect patient identifiers and share them with the EIP team.
- Survey records will use ID codes instead of hospital names and patient names; these codes will not be based on information that could be decoded to identify a hospital or patient. Links between codes and identifiers will be kept in secure locations in hospitals and EIP sites, and will not be shared with CDC.
- CDC will analyze and report aggregated data, within an EIP site or across all EIP sites.
- Patient identifiers (except selected dates and clinical information) that are collected and maintained in a secure manner by the PT or EIP team will be destroyed after survey activities are complete, or in accordance with local rules and regulations.

**What are the benefits to my hospital from participating in the 2015 survey?**

- This project will build upon the findings of the 2011 survey, informing national surveillance and prevention efforts.
- Participating hospitals will gain experience in prevalence survey methods that could be used in hospital-level infection control and antimicrobial stewardship-related assessments.
- Because we are minimizing the workload, hospitals will not survey enough patients to get precise estimates of HAIs and antimicrobial use at the hospital level. However, CDC and/or EIP staff will provide overall survey results to participating hospitals after the survey is completed.
- A letter or certificate of appreciation from the CDC and the EIP site will be provided to survey participants.
- Hospitals and staff may choose to be acknowledged by name in presentations or publications of survey results.

*CDC/EIP 2015 Healthcare-Associated Infections and Antimicrobial Use Prevalence Survey Overview*

**How much time is required to participate?**

*6-8 weeks before the survey:*

- For some hospitals, time may be needed to prepare and submit an Institutional Review Board (IRB) application to your hospital's IRB. Your hospital may or may not require IRB review. Your EIP contact should be able to help you with this. We estimate it may take 2 hours to prepare an IRB application, using materials provided to you by your EIP contact.

*4 weeks before the survey:*

- You will provide a list of your hospital's acute care inpatient units to your EIP contact, who will map each of these units to NHSN location codes (if not already mapped). We estimate it may take 1-2 hours to assemble the unit list and provide the EIP contact with descriptions of the types of patients cared for in those units. More time may be needed (e.g., 5 hours) in hospitals that have not already mapped their inpatient units for NHSN.
- You and other PT members may be asked to participate in a 1 hour training session. Training will be done via webinar or in person in your hospital. We will work to arrange the training for a convenient time.
- You and/or other PT members will complete a "Healthcare Facility Assessment;" this questionnaire, new in 2015, will provide information about infection control and antimicrobial stewardship in hospitals participating in the survey. We estimate that this questionnaire will take 45 minutes to complete.

*Morning of the survey (between 12:00 am and 8:00 am):*

- You will obtain a hard copy of your hospital's inpatient census for the survey day.

*On the survey day (during normal working hours):*

- The PT will conduct basic medical record reviews on 75-100 randomly-selected patients.
- Most hospitals will survey 75 patients (if your hospital has fewer than 75 patients, you will survey all acute care inpatients); large hospitals will survey 100 patients.
- We estimate that it will take 5-6 hours for 3 people to collect data on 75 patients, and 7-8 hours for 3 people to collect data on 100 patients.

*After the survey day:*

- You may be asked to provide limited assistance to EIP staff during the time they are reviewing medical records of surveyed patients in your hospital. This will not include any additional medical record review on your part, but might include activities such as orienting EIP staff to your medical records department and/or medical record system.

*Estimated total time commitment (preparation, training, record review and data collection):*

- Small or medium-size hospital, 75 patients surveyed, 3-person PT: 8 to 15 hours
- Large hospital, 100 patients surveyed, 3-person PT : 10 to 17 hours

**For more information:** Contact your EIP site. We will be happy to address any questions or concerns you may have about the survey, and will work with you to find ways to reduce the burden so that you and your hospital are able to participate.

**EIP contact name:**
**Email address:**
**Phone number:**
**Alternate Phone Number (mobile):**

**EIP contact name:**
**Email address:**
**Phone number:**
**Alternate Phone Number (mobile):**

**Thank You!**

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ORIGINAL ARTICLE

# Multistate Point-Prevalence Survey of Health Care–Associated Infections

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## ABSTRACT

### BACKGROUND

Currently, no single U.S. surveillance system can provide estimates of the burden of all types of health care–associated infections across acute care patient populations. We conducted a prevalence survey in 10 geographically diverse states to determine the prevalence of health care–associated infections in acute care hospitals and generate updated estimates of the national burden of such infections.

### METHODS

We defined health care–associated infections with the use of National Healthcare Safety Network criteria. One-day surveys of randomly selected inpatients were performed in participating hospitals. Hospital personnel collected demographic and limited clinical data. Trained data collectors reviewed medical records retrospectively to identify health care–associated infections active at the time of the survey. Survey data and 2010 Nationwide Inpatient Sample data, stratified according to patient age and length of hospital stay, were used to estimate the total numbers of health care–associated infections and of inpatients with such infections in U.S. acute care hospitals in 2011.

### RESULTS

Surveys were conducted in 183 hospitals. Of 11,282 patients, 452 had 1 or more health care–associated infections (4.0%; 95% confidence interval, 3.7 to 4.4). Of 504 such infections, the most common types were pneumonia (21.8%), surgical-site infections (21.8%), and gastrointestinal infections (17.1%). *Clostridium difficile* was the most commonly reported pathogen (causing 12.1% of health care–associated infections). Device-associated infections (i.e., central-catheter–associated bloodstream infection, catheter-associated urinary tract infection, and ventilator-associated pneumonia), which have traditionally been the focus of programs to prevent health care–associated infections, accounted for 25.6% of such infections. We estimated that there were 648,000 patients with 721,800 health care–associated infections in U.S. acute care hospitals in 2011.

### CONCLUSIONS

Results of this multistate prevalence survey of health care–associated infections indicate that public health surveillance and prevention activities should continue to address *C. difficile* infections. As device- and procedure-associated infections decrease, consideration should be given to expanding surveillance and prevention activities to include other health care–associated infections.

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Research

Original Investigation

# Prevalence of Antimicrobial Use in US Acute Care Hospitals, May-September 2011

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**IMPORTANCE** Inappropriate antimicrobial drug use is associated with adverse events in hospitalized patients and contributes to the emergence and spread of resistant pathogens. Targeting effective interventions to improve antimicrobial use in the acute care setting requires understanding hospital prescribing practices.

**OBJECTIVE** To determine the prevalence of and describe the rationale for antimicrobial use in participating hospitals.

**DESIGN, SETTING, AND PARTICIPANTS** One-day prevalence surveys were conducted in acute care hospitals in 10 states between May and September 2011. Patients were randomly selected from each hospital's morning census on the survey date. Data collectors reviewed medical records retrospectively to gather data on antimicrobial drugs administered to patients on the survey date and the day prior to the survey date, including reasons for administration, infection sites treated, and whether treated infections began in community or health care settings.

**MAIN OUTCOMES AND MEASURES** Antimicrobial use prevalence, defined as the number of patients receiving antimicrobial drugs at the time of the survey divided by the total number of surveyed patients.

**RESULTS** Of 11 282 patients in 183 hospitals, 5635 (49.9%; 95% CI, 49.0%-50.9%) were administered at least 1 antimicrobial drug; 77.5% (95% CI, 76.6%-78.3%) of antimicrobial drugs were used to treat infections, most commonly involving the lower respiratory tract, urinary tract, or skin and soft tissues, whereas 12.2% (95% CI, 11.5%-12.8%) were given for surgical and 5.9% (95% CI, 5.5%-6.4%) for medical prophylaxis. Of 7641 drugs to treat infections, the most common were parenteral vancomycin (1103, 14.4%; 95% CI, 13.7%-15.2%), ceftriaxone (825, 10.8%; 95% CI, 10.1%-11.5%), piperacillin-tazobactam (788, 10.3%; 95% CI, 9.6%-11.0%), and levofloxacin (694, 9.1%; 95% CI, 8.5%-9.7%). Most drugs administered to treat infections were given for community-onset infections (69.0%; 95% CI, 68.0%-70.1%) and to patients outside critical care units (81.6%; 95% CI, 80.4%-82.7%). The 4 most common treatment antimicrobial drugs overall were also the most common drugs used for both community-onset and health care facility–onset infections and for infections in patients in critical care and noncritical care locations.

**CONCLUSIONS AND RELEVANCE** In this cross-sectional evaluation of antimicrobial use in US hospitals, use of broad-spectrum antimicrobial drugs such as piperacillin-tazobactam and drugs such as vancomycin for resistant pathogens was common, including for treatment of community-onset infections and among patients outside critical care units. Further work is needed to understand the settings and indications for which reducing antimicrobial use can be most effectively and safely accomplished.

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