Emerging Infections Program (EIP)
Phase 2 Healthcare-associated Infection and Antimicrobial Use Prevalence Survey

EIP in New Mexico is a collaboration between the New Mexico Department of Health, University of New Mexico and CDC

Introduction

Healthcare-associated infections (HAI) cause significant morbidity and mortality worldwide and have received increasing focus in the United States (U.S.). Healthcare-associated infections in U.S. hospitals account for over 98,000 deaths [1] and result in an estimated $28-33 billion in excess costs each year (http://www.hhs.gov/ash/initiatives/hai/index.html). Preventing HAIs is a priority of the Centers for Disease Control and Prevention (CDC) and other federal agencies. While surveillance is often conducted for specific HAI at both the state and national levels, there is limited data on overall prevalence of HAI and antimicrobial use in the U.S.. The objectives of the Phase 2 Healthcare-associated Infection and Antimicrobial Use Prevalence Survey were to:

1. Work out logistical issues with survey methodology and procedures
2. Estimate HAI prevalence among inpatients in acute healthcare facilities
3. Determine distribution of HAI by pathogen and major infection site
4. Estimate prevalence and describe rationale for antimicrobial use in acute healthcare facilities

Reference
1. Klevens RM, Edwards JR, Richards CL, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-6.

Project Design and Methods

Design: This was a point prevalence survey, conducted on a single day in participating acute healthcare facilities. The survey was conducted in the 10 EIP states (CA, CO, CT, GA, MD, MN, NM, NY, OR, TN).

Methods: Healthcare-associated infections were defined according to existing National Healthcare Safety Network (NHSN) criteria. Each EIP site identified between 1-3 facilities for participation, to achieve a minimum total average daily census of 400 patients per EIP site. Facility participation was voluntary. There were 2 main data collection teams. The Primary Team (PT) consisted of infection prevention staff and other designated individuals in each facility. The EIP Team (EIPT) consisted of EIP staff. Both teams participated in survey training activities conducted by CDC and the EIP sites. The PTs conducted the survey on a single day in their own facilities. PTs collected basic demographic and risk factor data on a random sample (33% of average daily census) of inpatients occupying beds in their facilities on the survey date. Records of patients who were administered or scheduled to be administered ≥1 doses of a therapeutic antimicrobial agent(s) on the day of the survey or the day prior to the survey were subjected to detailed review by EIP epidemiologists/surveillance officers to assess antimicrobial use and identify HAIs. Institutional review board approval was obtained from CDC, New Mexico State University, and participating facilities.

Results: Hospitals and Patients

- 22 hospitals participated in 10 states
- 14 (64%) urban, 5 (23%) rural, 3 (14%) suburban
- 22 (100%) general hospitals
- 11 (50%) with academic affiliation
- 12 (55%) with electronic record systems, 8 electronic/paper combination, 2 paper
- 2015 patients surveyed by PT's/EIPT's

Results: Demographics

- Median age: 56 years (range from 1 day to 100 years)
- 14% of surveyed patients were <18 years of age
- Female: 50.9%
- Most common hospital locations: Medical ward = 20.5%, Med/surg ward = 8.9%, Surgical ward = 8.6%, Stepdown unit = 6.4%,Telemetry unit = 6.2%, Heme-Onc unit = 4.3%, All ICU types = 284/2015 = 14%

Results: Healthcare-associated Infections (HAI)

- 136 HAIs in 2015 surveyed patients 6.8% (95% CI: 5.7-7.9)
- 116 patients with HAIs 5.8% (95% CI: 4.8-6.8)
- 47 of 108 (43.4%) HAIs were attributed to ICU locations
- Pathogens were identified in 102 (75.0%) of the 136 HAIs

Table 1: Healthcare-associated infections by infection type

HAI Type	Number (%) (N=136)	HAI Type	Number (%) (N=136)
Pneumonia	44 (32.3)	Skin and soft tissue	4 (2.9)
Surgical site infection	28 (20.6)	Eye, ear, nose, or throat infection	3 (2.2)
Gastrointestinal	17 (12.5)	Central nervous system	1 (0.7)
Bloodstream infection	16 (11.8)	Cardiovascular system	1 (0.7)
Urinary tract infection	16 (11.8)	Systemic infection	1 (0.7)
Lower respiratory infection	5 (3.7)		

Table 2: Healthcare-associated infections by location of attribution

HAI Location of Attribution	Number (%) (N=108)
Medical ward	14 (12.9)
Surgical critical care	13 (12.0)
Surgical ward	9 (8.3)
Medical critical care	8 (7.4)
All other locations	<5% each

Table 3: Pathogens identified among patients with healthcare-associated infections

Pathogen	Number (%) (N=102)
Staphylococcus aureus	29 (28.4)
Klebsiella pneumoniae	13 (12.7)
Clostridium difficile	11 (10.8)
Escherichia coli	9 (8.8)
Pseudomonas aeruginosa	9 (8.8)

Results: Antimicrobial Use

- Antimicrobials scheduled or administered on survey date or prior calendar day for 1009/2015 patients (50.1%, 95% CI: 47.9- 52.3)
- Confirmed antimicrobial administration for 974/2015 patients (48.3%, 95% CI: 46.2-50.5)
- 1745 antimicrobials administered to 974 of 2015 surveyed patients: median 2 unique drug/route combinations per patient (range 1-8, IQR 1-2)

Table 4: Rationale for antimicrobial use

Rationale for Antimicrobial Use	Number (%) (N=1745)
Treatment of active infection	1341 (76.8)
Treatment of active infection at the patient level	733/2015 (36.4)
Surgical prophylaxis	189 (10.8)
Medical prophylaxis	152 (8.7)
None documented	59 (3.4)
Non-infectious	13 (0.74)

Results: Device Use

Table 5: Types of devices in use among patients on survey date

Type of Device	Number (%) (N=2015)
Central line	478 (23.7)
Urinary catheter	467 (23.2)
Ventilator	124 (6.2)

Summary and Next Steps

- HAI present in 6.8% of surveyed patients
- Pneumonia and surgical site infections were 2 most prevalent HAI and these comprised 52.9% of all HAIs detected
- Although ICU locations made up only 14% of the locations in which surveyed patients were located, they made up 43.5% of the locations to which HAIs were attributed
- Treatment of active infection was the most common rationale cited for antimicrobial use, followed by surgical prophylaxis

- Phase 3 (full scale survey) of the EIP HAI and Antimicrobial Use Prevalence Survey will be conducted in 2011
  - General adult and children's hospitals will be included in Phase 3
  - Eligible hospitals will be randomly selected for participation

Contact Information

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