

Louisiana Healthcare-Associated Infections Initiative Infection Control Survey Report.

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Introduction

Background and Justification

In August 2009, the Infectious Disease Epidemiology Section (IDES) of Louisiana Office of Public Health (OPH) received a CDC grant with the objective to create sustainable infrastructure for reporting on healthcare-associated infections (HAI) and related prevention activities. The CDC grant allows Louisiana to enhance its existing system by fully coordinating and integrating the existing components that results in a complete, cohesive, electronic, geographically diverse system. The result will be a stronger ability to analyze, identify trends, clusters and make recommendations for prevention and intervention strategies based on reported facts.

Study Goals

The objectives of the grant are divided into several activity areas:

- Integration, collaboration, and capacity building
- Reporting, detection, response and surveillance
- Prevention
- Evaluation and communications

In order to evaluate current capacities for the monitoring and control of HAI in Louisiana healthcare facilities, IDES conducted an infection control survey among major medical centers in each region of the state. Facilities were classified according to tier, where tier 1 is hospitals with emergency departments. Tier 2 is the classification assigned to all other facilities. Demographics of the facilities are described in table 1:

Table 1. Hospitals contributing data used in this report (N=38)

Tier Classification	Number Surveyed	Tier Total
Tier 1	35	121
Tier 2	3	138
Total	38	259

Methods

Sampling

A non-probability convenience sample was taken of the hospitals in the State of Louisiana, which was stratified by region. The sampling frame was a list of 196 healthcare facilities in the IDES database. Facilities selected were generally large, tertiary centers that would have the most patient visitation and treatment capacities. Table 2 describes the number of facilities reporting from each region:

Table 2. Regional representation in this report (N=38)

Region Number	Major City	Number Surveyed	Total Facilities
1	New Orleans	5	30
2	Baton Rouge	5	33
3	Houma	3	16
4	Lafayette	7	42
5	Lake Charles	1	23
6	Alexandria	3	23
7	Shreveport	6	32
8	Monroe	0	33
9	Slidell	8	27

Variables included in the survey are divided into the following categories: special units, microbiology lab, surveillance, data elements collected, surveillance rates, reportable diseases, outbreak investigations, and syndromic surveillance. Frequencies of such data will be described in this report.

Data Collection

The data for this study was collected through a self-administered survey taken by infection practitioners representing facilities chosen through the aforementioned stratified, convenience sample. Questions are grouped according to content and question format. Language used in the survey is profession-specific, and appropriate for nurses, medical technicians and doctors working in infection control.

Capacities of Reporting Facilities

Though most of the facilities reporting to this survey were acute care facilities, their capacities for patient care vary. Treatment units and laboratory capacities are described in table 3:

Table 3. Special units, more than one response accepted for each item

Tracked Data	N	%
Neonatal Intensive Care Unit	16	42.11
Pediatric Intensive Care Unit	9	23.68
Intensive Care Unit	27	71.05
Critical Care Unit	11	28.95
Transplant Unit	3	7.89
Bone marrow unit	5	13.16
Oncology unit	15	39.47
Hemodialysis	23	60.53
Blood bank	22	57.89

Results

Infection Control Personnel Capacities

The major factor influencing hospitals’ abilities to identify and control HAI is the number of infection practitioners (IP). Resources available to IP for continuing education and capacity-building are the Association for Practitioners in Infection Control (APIC) and the Certification in Infection Control (CIC) exam. A calculation was done to compute the ratio of IP in hospitals to the number of patient beds at the facilities. Consideration of workload dedicated to infection control was self-reported by IP. Job types included the following: surveillance, quality improvement, employee health, and clerical. Respondents were able to select more than one job type if necessary. Because the facilities responding to the survey were confidential, facilities are noted through their ID number. On average, the responding facilities had one IP per 264.7 patient beds. Table 4 describes the average bed/IP ratio per bed size in the facilities.

Because workload was divided among the aforementioned job types, fractions represented many of the IP job tasks, resulting in more patient beds for HAI workload than facilities actually housed. For example, if a facility with 100 beds and one IP whose job title includes employee health, surveillance, and quality improvement, only 33% of the practitioner’s time is dedicated to HAI surveillance. Therefore, the ratio calculation reflects that the HAI surveillance workload is magnified to 300 beds due to understaffing. See equation 1 and table 4 for demonstrations of the bed to IP ratio:

Equation 1. (100 beds/ (1/3 infection personnel)) = 300 beds per infection practitioner

Table 4. Reportable diseases and syndromic surveillance

Bed Size	Average Bed:IP Ratio
0-50	67.98
51-100	150.73
101-150	152.48
151-200	210.03
200+	433.32

Laboratory Capacities

In addition to having differing patient care capacities, reporting facilities also have different laboratory testing resources. The questions regarding microbiology laboratory usage and capacities assess IP attention to lab results and the use of such results. An antibiogram is the result of a laboratory testing for the sensitivity of an isolated bacterial strain to different antibiotics. By definition, antibiograms communicate in vitro-sensitivity (testing completed in the laboratory).

Table 5. Microbiology laboratory usage and capacities

Tracked Data	N	%
Do you use a local microbiology lab?		
Yes	32	84.21
No	6	15.79
Do you use a national private lab?		
Yes	20	52.63
No	18	47.37
Does the infection practioner review positive results?		
Yes	36	94.74
No	2	5.26
Do you produce a hospital antibiogram?		
Yes	32	84.21
No	6	15.79
If yes, how often is the antibiogram produced?		
Quarterly	3	7.89
6 months	9	23.68
Yearly	15	39.47
Unknown	11	28.95
Do you send the antibiogram to OPH?		
Yes	12	31.58
No	19	50.00
Unknown	7	18.42
Have you looked at the Antibiotic Surveillance page of the IDES website?		
Yes	14	36.84
No	23	60.53
Unknown	1	2.63

Surveillance Methodology

Infection practitioners conduct surveillance at facilities to monitor infection trends, identify clusters, and recommend best practices to the infection control committees of their respective facilities. Questions were administered regarding survey methodologies, collection and storage tools for information, infection prevention targets, and the five major infections of relevance for the HAI initiative. Table 3 shows responses generated from methodology questions:

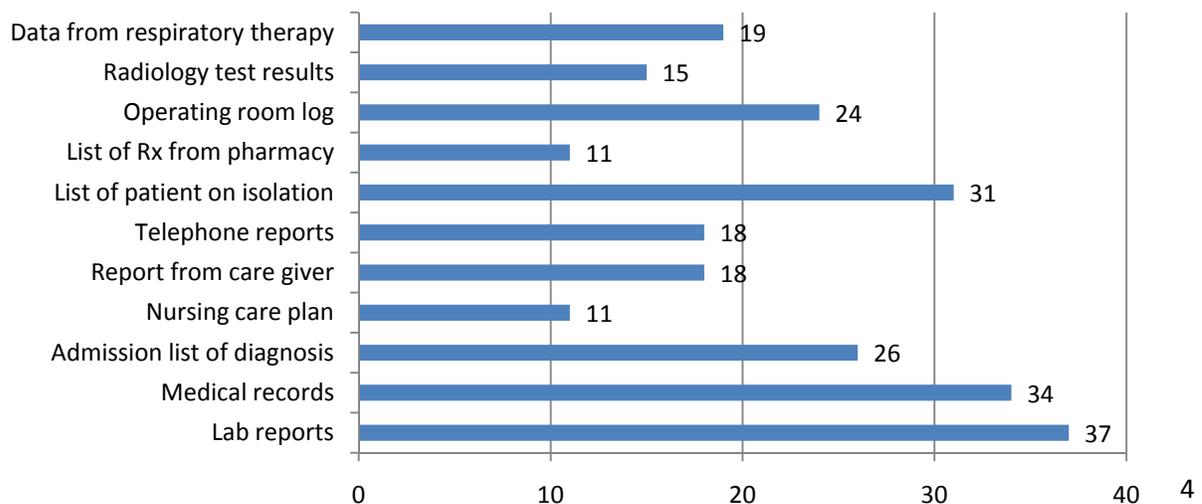
Table 6. Surveillance methodology questions responses

Question	N	%
Written description of how surveillance is done		
Yes	29	76.32
No	8	21.05
Unknown	1	2.63
Are you willing to fax your methods to OPH?		
Yes	14	36.84
No	21	55.26
Unknown	3	7.89
How is your surveillance completed?		
Full house, all time	28	73.68
Targeted	10	26.32
How often is your surveillance completed?		
*more than one response accepted		
Collected concurrently	29	76.32
Retrospectively	30	78.95
Do you produce a line listing of all infections?		
Yes	29	76.32
No	9	23.68
How do you store the information in your line listings?		
With a spreadsheet	24	63.16
Other	8	21.05
Missing	6	15.79

Data Source

Many sources for infection control can be used. Figure 1 demonstrates the data sources used by IP in Louisiana for nosocomial surveillance. Most surveillance is conducted by reviewing laboratory reports (n=37), medical records (n=34), and lists of patients in isolation (n=31).

Figure 1. Data sources used for surveillance by infection practitioners



Targeted units, devices, procedures, and pathogens

Table 7. Surveillance methodology questions responses. More than one response accepted for each category.

Targeted Measure	N	%
Data storage after collection		
Paper	24	63.16
Excel	30	78.95
Access Database	4	10.53
Another Database	10	26.32
Special Program	3	7.89
Units		
NICU	15	39.47
PICU	8	21.05
ICU	23	60.53
Hemodialysis	10	26.32
Blood bank	1	2.63
Bone marrow	2	5.26
Oncology	6	15.79
Transplant	1	2.63
Other	16	42.11
Devices		
All	11	28.95
Intra-vascular lines	17	44.74
Central lines	25	65.79
Urinary catheter	32	84.21
Other	13	34.21
Procedures		
Surgeries	33	86.84
Endoscopies	5	13.16
Other	5	13.16
Special Pathogens		
MRSA	35	92.11
C. difficile	34	89.47
VRE	30	78.95
DRSP	8	21.05
RSV	15	39.47
Rotavirus	6	15.79
Influenza	25	65.79
Other	16	42.11
Special pathogens screened		
MRSA	21	55.26
Other	6	15.79

National Healthcare Safety Network (NHSN) Utilization

The NHSN is a voluntary, secure, internet-based surveillance system that integrates patient and healthcare personnel safety surveillance systems managed by the Division of Healthcare Quality Promotion (DHQP) at CDC. During 2008, enrollment in NHSN was opened to all types of healthcare facilities in the United States, including acute care hospitals, long term acute care hospitals, psychiatric hospitals, rehabilitation hospitals, outpatient dialysis centers, ambulatory surgery centers, and long term care facilities.

NHSN is the major tool by which the HAI initiative may become underway in Louisiana. NHSN assures the confidentiality for reporting facilities, while collecting standardized data to estimate the magnitude of adverse events among patients and healthcare personnel. Data collected in NHSN are used for improving patient safety at the local and national levels. In aggregate, CDC analyzes and publishes surveillance data to estimate and characterize the national burden of HAI. At the local level, the data analysis features of NHSN available to participating facilities range from rate tables and graphs to statistical analysis that compares the healthcare facility's rates with the national aggregate metrics.

Survey respondents were asked to reply on specific questions regarding NHSN utilization as a data collection tool, and their use of CDC definitions when counting cases. Responses are noted in table 8:

Table 8. Use of NHSN and infection definitions

Collection tool and definition	N	%
Use of standardized form to collect data on HAI cases		
Yes	28	73.68
No	10	26.32
Aware of NHSN standardized forms		
Yes	27	71.05
No	11	28.95
Use NHSN standardized forms		
Yes	7	18.42
No	23	60.53
Did not respond	8	21.05
Use NHSN forms with modifications		
Yes	7	18.42
No	31	81.58
Use CDC Definitions		
*more than one response accepted		
Yes	32	84.21
No	6	15.79
Other definitions	1	2.63
Producing Line Listing of Infections *more than one response accepted		
Spreadsheet format	24	63.16
None	9	23.68
Other	8	21.05

Infections of significance to the HAI initiative

The HAI grant is focusing on the following healthcare associated infections:

- Multiple Drug Resistant Organisms (MDRO)
- *Clostridium difficile*-associated diarrhea (CDAD)
- Central line associated bloodstream infections (CLABSI)
- Catheter associated urinary tract infections (CAUTI)
- Surgical site infections (SSI)
- Ventilator-associated pneumonia (VAP)
- Methicillin-resistant *Staphylococcus aureus* infections (MRSA)
- Mediastinitis following Coronary Artery Bypass Graft (CABG)
- Certain orthopedic procedures Bariatric surgery for obesity

The first prevention priorities will be the reduction of SSI, BSI, CLABSI, VAP and UTI. Questions on each of these infections were administered and answered by self-response. More than one factor was tracked for most of the infection types. Results are described in figure 2 and tables 9-10:

Figure 2. Data tracking blood stream infections (BSI)

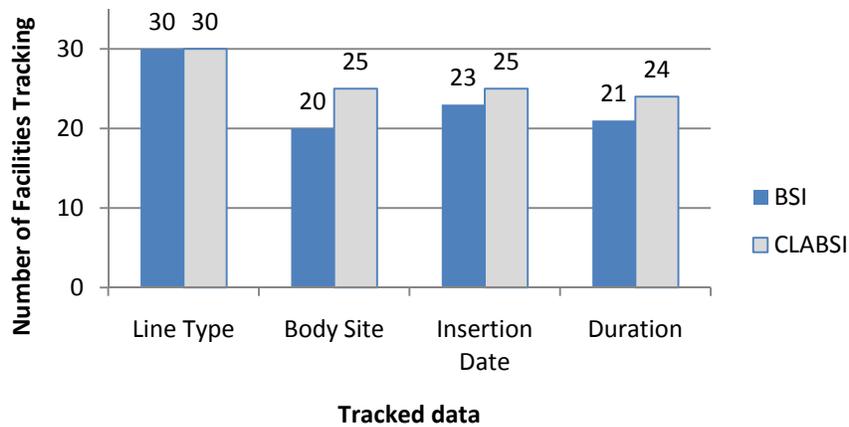


Table 9. Surgical site infections (SSI)

Tracked Data	N	%
Anatomical Sites		
All	25	65.79
Limited	8	21.05
Unknown	5	13.16
Period		
Year round	26	68.42
Limited	0	0.00
Unknown	12	31.58
Risk Factors Collected, *more than one response accepted		
ASA	24	85.71
Wound class	25	89.29
Duration	20	71.43
Other	5	17.86

Table 10. Ventilator-associated pneumonias (VAP) and Urinary tract infections (UTI)

Tracked Data	N	%
Ventilator Associated Pneumonia		
Yes	24	63.16
No	13	34.21
Unknown	1	2.63
Urinary Tract Infections, *more than one response accepted		
Catheter Type	24	63.16
Insertion date	26	68.42
Duration	25	65.79

Data Elements Collected

Table 11 describes variables tracked for patients by infection practitioners:

Table 11. Data elements collected, more than one response accepted for each item

Tracked Data	N	%
Patient ID	34	89.47
Medical record number	34	89.47
Admission date	35	92.11
Event date	36	94.74
Discharge date	23	60.53
Unit	32	84.21
Physician name	31	81.58
Type of infection	36	94.74
Type of procedure	34	89.47
Date of procedure	33	86.84
Definition items	18	47.37
Date of definition item	12	31.58
Pathogen	33	86.84
Sensitivity	24	63.16

Surveillance Rates

In order to determine if diseases are increasing in frequency, correlating with suspected causes, or have changed since measures were instituted, rates are compared to make sense of such questions. Some rates commonly used in epidemiology are incidence, prevalence, crude death rate, case-fatality rate, infant mortality, and others. For purposes of comparing, rates should be standardized based on patient populations in order to compare facilities with similar capacities. Table 12 describes the rates generated in the reporting facilities:

Table 12. Surveillance rates generated

Rates	N	%
How are the rates generated?, *more than one response accepted		
NHSN	8	21.05
Ad hoc spreadsheet	7	18.42
Calculator	24	63.16
Other	9	23.68
How often do you generate a report?, *more than one response accepted		
Weekly	2	5.56
Monthly	20	52.63
Quarterly	22	59.46
Other	6	15.79
Do you compare your rates with other hospitals?		
Yes, with NHSN	16	42.11
Yes, other	10	26.32
No	8	21.05
Unknown	4	10.53

Table 13. Reportable diseases, outbreak investigations and syndromic surveillance

Question and Response Option	N	%
Do you track reportable diseases?		
Yes	29	76.32
No	8	21.05
Unknown	1	2.63
If yes, what program do you use?		
State reporting program (RDD replaced by IDRIS)	37	97.37
Other	1	2.63
Do you report to OPH?		
Yes	19	50.00
No	19	50.00
With what method do you report to OPH?, more than one response accepted		
State reporting program	29	76.32
Fax reports	15	39.47
Other	6	15.79
Did you know OPH can assist in outbreak investigations?		
Yes	26	68.42
No	12	31.58
Did you know OPH can perform PFGE on specimens submitted?		
Yes	17	44.74
No	20	52.63
Unknown	1	2.63
Are the chief complaints in your emergency department entered electronically?		
Yes	18	47.37
No	17	44.74
Unknown	3	7.89
Are the chief complaints in your ICU entered electronically?		
Yes	14	36.84
No	21	55.26
Unknown	3	7.89

Conclusion

The frequencies generated in this report will create directives for the IDES Healthcare-Associated Infections grant. As mentioned, the goal of this survey was to assess current surveillance capacities of infection practitioners, identify facilities currently using NHSN, and determining training needed for our state facilities in surveillance. Responses will be useful to our grant partners and CDC.