

Summary of Infection Prevention and Control Program Assessment

Prepared for:
The Delaware Health and Social Services
Division of Public Health

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Introduction/Background

The Delaware Division of Public Health (DDPH) selected APIC Consulting Services Inc. (ACSI) to perform a needs assessment in hospitals reporting healthcare-associated infection data (HAI) to the National Healthcare Safety Network (NHSN). The needs assessment was designed to identify, quantify, and prioritize barriers to expansion to the existing program of reporting central-line bloodstream infections (CLABSI) data from an ICU (intensive care unit) in each facility and for those reporting of surgical site infections related to hip replacement surgeries to NHSN.

Our assessment focused on the following:

- Developing a standardized tool for assessing each facility
- Observing data collection methodologies within each facility
- Interviewing infection preventionists (IPs), critical care unit denominator data collectors, and information technology (IT) staff
- Identifying commonalities between facilities and unique issues
- Recommending possible ways in which barriers may be negotiated including adding or leveraging IT, education, process, and/or human resources.

As mandated reporting of HAIs and national elimination targets continue to redefine the IP's role, they are increasingly doing more with less. To date, technology has advanced at a pace that challenges our ability to use it.

NHSN is a powerful tool that allows national comparisons to occur using standard definitions as a base. The IP can input data into NHSN directly from most electronic surveillance systems. However, without a surveillance system that performs this function, collecting and uploading data manually can consume hours that would be better spent on prevention of HAIs.

DDPH is committed to helping infection prevention and control (IPC) programs transition to these new reporting demands. As such, this assessment of IPC programs throughout Delaware was undertaken in an attempt to identify what hospitals are currently reporting to NHSN, what barriers might be present, as well as the general state of the IPC programs.

Methods

The assessment focused on methods and processes, including data collection, for CLABSIs in a critical care unit at each hospital and surgical site infections after hip replacement surgery or hernia repairs where applicable. In addition to NHSN reporting status, an assessment of the IPC program and the IP basic competencies was also conducted. Please note that abbreviations used in this report are presented in Attachment 1 on page 11.

Site visits were made by two ACSI consultants to each of the seven Delaware hospitals that took advantage of the evaluation project. At least one Infection Preventionist from each program completed the standardized survey tool developed by ACSI for this project. A sample copy of the tool is presented in Attachment 2 on pages 12 to 24. The primary purpose of the tool was to identify strengths and opportunities about the IPC programs in the following areas:

1. Epidemiology – practice based on sound principles of epidemiology
2. Education – health care team is aware of their role in infection prevention and control
3. Partnerships – developed for the design and implementation of IPC interventions
4. Interventions – mechanisms and processes in place to ensure implementation of IPC interventions
5. Seamless Approach – provide a seamless approach to infection prevention and control throughout the continuum of care
6. Infection Preventionist – education and resources

Within each section, detailed information was obtained on IT needs, reporting, personnel, etc. Onsite, the consultants met with key hospital personnel to discuss the culture, organizational structure and hospital processes pertinent to the IPC program. Examples of reports were reviewed, data entry processes demonstrated and a tour of the facility conducted by the IP.

Findings/Results

Detailed finding for each individual hospital are presented in Attachment 3 on pages 25 to 61. Using the key program areas as headings, overarching findings are discussed in the following sections.

Epidemiology – (practice based on sound principles of epidemiology)

All 7 Delaware hospitals surveyed had surveillance programs in place. They are collecting data based on standard indicators using appropriate definitions. Four hospitals are collecting data using a completely manual methodology, two hospitals have an automated system and one hospital has some data available in electronic reports. Every hospital has at least one step in the process of collecting surveillance data that requires manual input at some point. Denominator data, in particular, needs data entry in all cases.

Five of the seven hospitals are using basic analysis of their data and are expressing their data in simple rates. Two of the hospitals are using standard infection ratios (SIRs) for their rate comparisons. Both of these hospitals have some access to a statistical analyst. Use of the SIR is considered to be best practice and yet most are not using it in the hospitals we visited.

Reports are distributed to customers as graphs or tables in all of the surveyed hospitals. NHSN reporting is being completed on required procedures and processes. In 5 of 7 hospitals the reporting is a completely manual process. The process is automated in two of the hospitals with the use of an automated surveillance system, *Safety Surveillor*.

Many hospitals are not having regular reviews of which indicators are being tracked to assure that they are aligned with organizational priorities and public reporting. Data collected without targeted intervention is labor intensive and has limited benefits.

Recommendations:

- Most of the hospitals are collecting denominator data manually. This data may be available in-house through a midnight census or a simple program could be developed to prevent re-keying of data provided by the individuals counting denominators in the unit. Information systems development of data feeds for denominators could be developed or purchased.

- Many hospitals will begin reporting hysterectomy and colon surgical site infections (SSIs) in 2012. Education and tools to help the IPs can be developed in advance to assist the IPs with proper reporting and data collection. SSIs have more rigorous data entry requirements because all procedures are input and multiple risk factors are used in denominator calculation.
- Best practice indicates that the use of SIRs in rate comparison and a solid understanding of statistical analysis are of utmost importance to truly understand the data collected through surveillance efforts. We recommend that training on SIRs and statistics be made available to the IPs either in-state or through the provision of travel money to targeted courses, such as APIC's EPI courses
- Hospitals need to be diligent in reviewing which indicators are being tracked to assure that they are aligned with organizational priorities and public reporting requirements to avoid needless data collection.

Education

In all surveyed hospitals education is provided on HAI prevention measures. In 7/7 hospitals the IPs felt that more education would be beneficial to decrease HAIs and create more ownerships of infection prevention by the frontline staff. All hospitals are using direct observation to measure the success of education efforts. This process is time consuming and represents only a snapshot in time. Pre- and post-intervention testing can more accurately measure the impact of education.

Recommendations:

- A standard educational module collecting NHSN denominator data is recommended. ACSI's experience has been that the IPs understand how the denominator data is counted but unit nurses are often not trained on the nuances of NHSN definitions.
- Hospitals could purchase or develop education tools that can be used by hospitals to educate staff on HAI prevention. Webinars, online modules, and interactive program kits are various methods of deliverables that might be considered. Organizations such as APIC and CDC have, or could develop these tools.
- For any state-developed courses, measurement tools should be developed. Without the ability to measure the understanding of the learner, it is difficult to quantify the success of the educational module.

Partnership

The engagement in HAI prevention initiatives varies among hospitals. In 5/7 hospitals surveyed the Medical Director is not compensated for their support of the IPC programs. Private medical staff is difficult to engage in all of the Delaware hospitals. Hospital employed physicians and medical staff in training are more likely to comply with education requirements and prevention measures. The Medical Director in 5 of 7 hospitals has not been formally trained in hospital epidemiology (i.e. SHEA CDC training course).

While all hospitals have a multidisciplinary Infection Control Committee, the IP is responsible for all surveillance activities with no unit-level liaisons in most hospitals. Access to clinical and administrative leadership in 5 of 7 hospitals meets the needs of the program.

Recommendations:

- Of primary importance is to encourage all Medical Directors to receive formal training in hospital epidemiology. The local APIC chapter could provide support through scholarships to existing training programs or development of a Hospital Epidemiology training program for hospital medical directors.
- Likewise, a statewide initiative to identify educational opportunities for IPs in all career stages across Delaware hospitals. This may include soft skills such as managing up or executive-level communications to assist IPs in providing information to unit leaders and senior administration.

Interventions

All hospitals surveyed have HAI intervention teams in place surrounding most healthcare associated infections. These prevention strategies are incorporated into the daily work of the hospitals teams. In 5 of 7 hospitals, there is a process of sharing patient level infection prevention information quickly and electronically. The two remaining hospitals require acknowledgement of information by the IP and the information must be then relayed to the hospital staff.

Physicians and HCWs (healthcare workers) are not held accountable for compliance with IP practices in 4 of 7 hospitals. There is not a mechanism in the hospitals to correlate compliance with performance review or physician credentialing.

Recommendations:

- Support hospitals in the development of programs that integrate patient safety and IPC training (and behaviors) into performance evaluation and physician credentialing. Consider supporting a state requirement for documentation of compliance and basic education/training.

Infection Preventionist

The Delaware Infection Preventionists surveyed were generally experienced, knowledgeable and motivated. In 5 of the 7 hospitals, there are certified IPs holding the Certification in Infection Control (CIC). The two IPs that are not yet certified have been in their position less than a year. Both of these IPs have attended formal orientation to IPC. One of these hospitals has the support of certified IPs within their hospital system.

All IPs have access to computers and basic software needs are met. More advanced surveillance and epidemiology software is available in only 2 of 7 hospitals surveyed. Staffing levels do not meet the CDC (Delphi¹ Study) recommendations of 1 IP for every 100 occupied beds in 3 of 7 hospitals. The Delphi study looked at acute care, long-term care and community care settings in 20 states in order to develop a recommended IP to bed ratio. A ratio of 1.0 was recommended for acute care hospitals.

Recommendations:

- IPs can promote the importance of information technology support to executive leadership in Delaware hospitals.
- IPs may encourage hospital investment in surveillance systems by educating executives about the cost-benefit and increased productivity, negotiating with vendors for a statewide discount, or working together to fund a basic Excel-based template that can allow for NHSN data collection that can be uploaded directly into NHSN without rekeying.
- Educational programs for experienced IPs in statistical analysis, performance/process improvement and research (application to practice) to assure IPs have the essential base knowledge to conduct surveillance may be offered within the state.
- Consider the development of a requirement for minimum numbers of IPs per bed in line with the CDC recommendations.

¹ O'Boyle C, Jackson M, Henly SJ. Staffing requirements for infection control programs in US health care facilities: Delphi project. Am J Infect Control 2002;30:321-33.

- Scholarships for new IPs to attend local and national programs, especially to prepare for certification could be started through the local APIC chapter.
- Speakers on key NHSN topics could be provided to the local APIC Chapter and encouragement provided the Chapter to implement a statewide IP mentoring program.
- Consider recommending that IPs become certified with 2-3 years of employment in a Delaware hospital.

Discussion

In general, Delaware hospital IPC programs demonstrated strengths in the areas of Epidemiology (IPC programs based on sound principles of epidemiology) and Infection Preventionist (knowledge and resources). All hospitals are reporting to NHSN but resources necessary to accomplish this work are radically different and represent an opportunity to standardize surveillance methods.

Surveillance programs such as *Safety Surveillor*, used in the Christiana Care Health System, have the advantage of being interfaced with key data systems in the hospital needed to collect data and construct files in the format needed for automated reporting to NHSN. Other IPC programs in Delaware are still relying on manual processes to perform this function. The development of a basic Excel-based collection tool and the negotiation of a group discount on a more expensive program are ways to leverage the collective efforts of the IP community. Denominator collection appears to be the most urgent need for all hospitals, and yet a simple spreadsheet on a shared drive could eliminate double-keying immediately.

The time devoted to NHSN data entry is presently measured in hours per month, but will escalate quickly as new indicators are added to the reporting burden. The trend has been to find technologies and methods to help transition from surveillance focused IPC programs to performance improvement programs. The burden of increasing data entry pulls the IP away from the development and implementation of interventions and the facilitation of performance improvement initiatives that reduce HAIs.

The IPC programs throughout the state have the advantage of being staffed in large part by seasoned IPs that have achieved and maintain certification (CIC). The CIC credential denotes mastery of fundamental knowledge required for competent performance of current infection prevention practice. We found only a minority of IPs without the credential and they were new IPs working toward certification. All IPs should be encouraged to attain CIC certification within two to three years of being hired. Additionally, the number of IPs per bed is a bit low at many hospitals. We recommend hospitals follow the CDC recommendations.

The Delaware IPs have broad clinical skills attained from career foundations as registered nurses and medical technologists. In their organizations they must be considered leaders who can influence without direct authority, leading Performance Improvement (PI) teams focused on reducing HAIs. Advances in informatics resulting in e-surveillance systems, electronic health records (EHR) and enterprise-wide data warehouse (EDW) technologies are constantly on the horizon. IPs must understand and utilize these technologies to free up time for performance improvement work.

All of the IPs are well versed in online resources for literature searches, reading journals, and participating in list-servers to address their needs. Interpretation of advanced data analysis and research findings is a growing need as more programs begin to use PI tools (e.g. PDSA, Lean, Six Sigma) to implement evidence-based prevention measures. Not all have the support of their organizations for attending meetings and yearly conferences, a vital activity for bringing new ideas to an IPC program, and continued development of professional competencies.

This represents an opportunity to promote IP education through training, exposure to new technologies, and informational sessions on new and pending legislation. The existing infrastructure of the local APIC chapter can provide a mechanism for education.

Collectively, the IPC programs throughout the State have developed a number of surveillance, collection and risk assessment tools as well as the innumerable policies required. Many websites allow for inexpensive hosting of documents that could serve as an online library as a resource for the Delaware IPC programs. This might also help to promote consistent policies and practices throughout the state.

The IPC programs have some degree of physician leadership support – most with part time medical direction (contracted) and some voluntary, less dedicated clinical support. It is critical that physicians providing direction on reduction of HAIs receive formal training in hospital epidemiology, which is offered annually by the Society for Healthcare Epidemiology of America (SHEA) and CDC. Assuring this education for contracted and volunteer IPC Medical Directors is important. Perhaps collectively the IPs could reach out to SHEA to bring the training to Delaware providing information as to the location of training sessions held elsewhere.

Conclusions

There are a number of opportunities for the IPs in Delaware to work together to encourage best practices in NHSN reporting. Among them are:

1. Promoting the importance of information technology support to the IP department by executive leadership. This can be done through existing communications channels within DDPH or through the provision of this report to executive leadership.
2. Helping to bridge the gap in electronic data collection, starting with the development or purchase of a template for denominator collection that could be housed on shared drives within the hospital. Hospitals can work together to share tools for data collection between hospitals, developing or purchasing a template for data collection based on Excel. (APIC has such a template under development), or negotiating a group rate for a data collection program for Delaware hospitals.
3. Developing a library for best practice templates, tools, and policies for Delaware hospitals. With the ease of website development, a simple webpage housing downloadable items that is password protected will allow IPs to share information.
4. Providing training to IPs on electronic data collection, statistical analysis and NHSN. APIC and CDC both provide such training and this can be done by bringing expertise into the state or region or providing assistance with travel to attend national meetings.
5. Encouraging certification for all IPs and training for Medical Directors. Certification is crucial for professionals. An IP with certification understands surveillance better than a nurse who is new to the field. Likewise, Medical Directors who have training in epidemiology will better understand the objectives of the IP department and help to guide surveillance operations to study only what is crucial and necessary.
6. Encouraging all hospitals to invest in surveillance systems. A more expensive option is to provide a robust surveillance system for all hospitals. While this may not be possible for all, a group discount may be enough to allow the purchase.



Wilmington Hospital Results

7. Requiring that all hospitals have the minimum IP staffing levels recommended by the CDC. The recommended ratio of IP to acute care beds is 1.0. A state mandate or recommendation may help the IPs make the case to add staff. However, the reduction of data entry duties can help hospitals with lower ratios come closer to accomplishing the necessary workload.

Closing

It was ACSI's pleasure to participate in this program assessment. Our team was welcomed in each facility visited. We appreciated the opportunity to meet so many experienced IPs in the state.

We look forward to the opportunity to work with DDPH to develop an article or paper to share the findings with other states. We believe that the need for additional support from the states in the areas of education and electronic data transmission is universal. Delaware's findings can serve as a benchmark for all as the focus on infection prevention and public reporting expands.

Please do not hesitate to contact us if you have any questions or if we can be of assistance with implementing any of our findings

Attachment 1. Abbreviations Used in This Report

ACSI	APIC Consulting Services, Inc.
CAUTI	catheter associated urinary tract infection
CDC	Centers for Disease Control and Prevention
<i>C. diff</i>	<i>Clostridium difficile</i>
CIC	certification in infection control
CLABSI	central line associated bloodstream infections
COO	Chief Operating Officer
CUSP	comprehensive unit-based safety program
EDW	enterprise-wide data warehouse
EHR	electronic health record
EMR	electronic medical record
HAI	healthcare acquired infections
IP	Infection Preventionist
IPC	infection prevention and control
IT	information technology
LEAN	process improvement methodology focused on waste reduction
LOS	length of stay
MDRO	multi-drug resistant organism
MT	medical technologists
NHSN	National Healthcare Safety Network
OR	operating room
PDSA	Plan-Do-Study-Act; improvement methodology
PI	Performance or process improvement
RCA	root cause analysis
RN	registered nurse
Safety Surveillor	Premier, Inc. electronic surveillance system
SCIP	surgical care improvement project
SHEA	Society for Healthcare Epidemiology of America
SIR	standardized infection ratios
Six-Sigma	process improvement methodology focused on variation reduction
SSI	surgical site infections
UCL	upper control limits
VAP	ventilator associated pneumonia