

1-Introduction

The Louisiana Department of Health and Hospitals (DHH) Office of Public Health (OPH) is responding to a CDC Request for Proposal for surveillance, monitoring, reporting and preventing health care associated infections (HAI) to the Centers for Disease Control and Prevention.

This proposal outlines a comprehensive approach to creating a statewide HAI surveillance program. This proposal describes how the CDC's vision can be realized with an appropriate focus on cost, value and sustainability to achieve transformational change in patient safety in Louisiana by reducing these HAI. DHH-OPH's proven ability to create new partnerships and build upon existing relationships will be highlighted as a key to developing an effective statewide surveillance system and approach to HAI prevention and reduction.

2-Background and Need

The Office of Public Health's IDES, located in New Orleans, operates in all nine public health regions of Louisiana. In each region, the section is staffed with a regional Disease Surveillance Specialist and a Regional Epidemiologist under the supervision of a Regional Medical Director.

2.1-Reporting of communicable diseases and Surveillance

Louisiana has developed some disease surveillance systems and infrastructure, but a majority of this effort is focused on community-acquired infectious diseases rather than supporting the surveillance and reporting of HAI. Although the state has long been interested in expanding their surveillance to include these infections, it has remained a challenge due to funding and staffing issues. Although there is no coordinated statewide approach to HAI surveillance and reporting, there is some reporting of infections by some hospitals and by the Louisiana Department of Health and Hospitals Office of Public Health.

Health care providers in Louisiana are mandated by the Public Health Sanitary Code to report infectious diseases. Providers can report to these to OPH via a secure access to the web-based Reportable Disease Database at <https://ophrdd.state.la.us>. Later this year, OPH plans to upgrade the Reportable Disease Database to the Infectious Disease Reporting Information System (IDRIS). This will be a secure web-based system that is Public Health Information Network (PHIN) compliant.

Reporting of diseases (that require notification to the health department) is the backbone of disease surveillance in Louisiana and nationally. All health care providers and related professionals are required by law to report cases of selected diseases and conditions. In order for the data to be comparable among states and nationally, reported cases are evaluated in the OPH central office to determine if they meet uniform case definitions from the Council of State and Territorial Epidemiologists (CSTE) and CDC. Follow-up or intervention activities are conducted as warranted.

IDES utilizes a web-based Reportable Disease Database (RDD), which is on a secure data network (SDN). Based on an Oracle ® database and an Active Server Page (ASP) interface, this system has been operational since 2002 and is in use statewide among 112 hospitals, 35 emergency rooms, four emergency medical services, 40 public health units, three private physicians, two laboratories and one nursing home. The field epidemiology staff actively recruits additional reporting hospital/clinic sites and other health care facilities. Each facility has access to their reported data only. The system meets the standards of confidentiality required by state and federal law.

Hospital staffs using the RDD system are assigned an ID and password. Each facility has access to their reported data. The system meets the standards of confidentiality set up by state and federal law (HIPAA).

2.2-Disease outbreak investigations

IDES investigates disease outbreaks; monitors trends in infectious disease occurrence; publishes statistics, reports and makes recommendations about infectious diseases; provides consultation on prevention of infectious diseases; and provides training in infectious disease prevention and methods of epidemiology.

OPH has also developed a syndromic disease surveillance system that is in place in some hospitals. The purpose of this system is to serve as a mechanism for early detection, warning and monitoring of suspicious illnesses. The Web-based system utilizes sentinel providers throughout the state.

2.3-Antibiotic resistance surveillance

OPH also collects data on antibiotic sensitivity through an Active Laboratory Surveillance and compilation of hospital antibiograms from about 40 hospitals per year. Using both of these sources, OPH's Infectious Disease Epidemiology Section (IDES) identifies and monitors trends in antibiotic resistance and the "Louisiana Antibiogram."

The Louisiana Antibiogram shows mean antibiotic sensitivity, standard deviation, lowest and highest for hundreds of bacteria/antibiotic combinations. This provides hospital staff with comparative data for their internal program evaluation. Results based on aggregate data are posted on the IDES website.

2.4-Expanded surveillance

Prior to 2000, these reports focused on the results of the infectious diseases passive surveillance programs. The current format of the report has been expanded to present a more comprehensive view of the infectious diseases of public health importance. In addition to discussing the results of passive surveillance, today's report includes data on hospital discharges, active surveillance, results of surveys, estimations based on national surveillance and summaries of articles.

The report has always described a number of reportable diseases, but it has not focused on health care associated illnesses.

2.5-Laboratory surveillance

The OPH Laboratory is a PulseNet participant. Specimens of *E. coli* O157:H7, Non-O157:H7 Shigella Toxin Producing E. Coli (STEC), Listeria, Shigella, Salmonella, Campylobacter, *Vibrio cholerae* and *Vibrio parahaemolyticus* are sent by health care facilities for confirmation and PFGE analysis.

IDES and the OPH laboratory continue to participate in the NARMS program. The Laboratory continued to send every twentieth non-typhi Salmonella, every *Salmonella typhi*, every twentieth Shigella, every twentieth *E. coli* O157, every Listeria, non-cholerae vibrio and *Vibrio cholerae*, for testing at the NARMS laboratory.

PFGE is also used to support the outbreak investigation carried out by the health care facilities to identify strains that have similar genetic makeup and thus are part of the same cluster of infections. The OPH laboratory has conducted PFGE analysis for Acinetobacter, Stenotrophomonas, MRSA (identifying USA 300 strain and other PFGE groups). When no PFGE analysis is available, the OPH lab has still been able to provide support; the most recent example was an "outbreak" of Bacillus species in a NICU. The OPH lab was able to speciate the Bacillus.

2.6-Communication / Education

In addition, OPH also publishes periodicals in Louisiana Morbidity Reports and Louisiana State Medical Society's Journal, as well as disseminating antibiograms.

IDES conducts regular educational trainings to infection control staff in hospitals. These include regular video teleconferences, yearly field trainings offered to hospital staffs, weekly trainings via the Web-based "Learn Link" system and annual presentations to the three chapters of the Association for Practitioners in Infection Control and Epidemiology (APIC) in Louisiana.

IDES has produced guidelines on the prevention of all reportable diseases and other infectious agents (about 100 conditions) of interest for health care facilities. These guidelines are posted on the IDES website under the banner “Epidemiology Manual. They are consistent with CDC and national associations’ guidelines (such as the American Academy of Pediatrics, Infectious Disease Society of America). These guidelines are used by OPH and hospital staff when prevention questions arise.

URL: www.infectiousdisease.dhh.louisiana.gov

The IDES maintains an up-to-date email database of hospital infection prevention and control personnel, allowing for easy and rapid communications.

The Louisiana Office of Public Health has extensive experience in developing working groups, partnerships, collaboratives and advisory committees that serve to inform, make recommendations and offer guidance for addressing critical public health issues.

2.7-Individual hospitals’ initiative

Several hospitals have been active in reducing HAI. Two that have been remarkably successful and which have publicized their results are St. Tammany Parish Hospital and Slidell Memorial Hospital. The state plans to use this grant funding to build upon these individual efforts in the prevention of Hospital-associated MRSA infections.

The current HAI surveillance system is fragmented, fractured, uncoordinated, geographically dispersed and incomplete. The work that we propose by creating this statewide HAI surveillance system will enable the state to more accurately measure the rate of HAI, thus building the foundation to develop a strong and effective prevention effort.

At present, no aggregate data exists. Because current state reporting efforts focus primarily upon community-acquired contagious diseases, this new effort will not duplicate any existing activities, rather it will allow the current efforts to be fully coordinated.

This CDC grant will allow Louisiana to enhance its existing system by fully coordinating and integrating the existing components, resulting in a complete, cohesive, electronic, geographically diverse system. The result will be an enhanced ability to analyze, identify trends and clusters, and make evidence-based recommendations for prevention and intervention strategies.

3-Project Objectives

3.1-Staff development:

The Department of Health and Hospitals Office of Public Health is designating Dr. Raoult Ratard, State Epidemiologist, as the principal investigator for this grant.

Reporting directly to Dr. Ratard will be the State HAI Plan Coordinator. The program will be integrated with other activities of the IDES which will be trained in infection control.

The IDES will be responsible for the preparation and implementation of the plan, and monitoring of infection control practices in collaboration with department managers, medical staff and the infection prevention staffs of health care facilities throughout Louisiana.

3.2-State Plan Advisory Group

For the healthcare associated infections project, IDES will set up a State Plan Advisory Committee including members with infection prevention and control expertise. Throughout the development of the plan, the group will be asked to provide comments on a monthly basis. The advisory group will be charged with making recommendations to Louisiana’s development and implementation of a comprehensive HAI prevention Plan.

Once the Plan is complete and submitted to the CDC, the group will be provided quarterly updates as to the HAI project for the duration of this contract.

The scope of work of the advisory group will be twofold:

During the development of the State Plan – Provide input, guidance and recommendations that will be included in the Plan.

Once the Plan is submitted to CDC – The Advisory group will provide guidance on the development of the surveillance network, and provide recommendations as to the prevention efforts undertaken by the State.

IDES will also maintain communication with the existing Louisiana Health Data Panel. This statutorily-created advisory group is helping DHH implement a Web-based source of information on the cost, quality and performance of health care providers. The panel consists of representatives from consumer, technology, academic and health care organizations.

3.3-HAI State prevention Plan

OPH will develop and begin the implementation of an HAI Prevention State Plan by January 1, 2010.

3.4-Network of Sentinel Hospital reporting HAI

During the second of the grant the overall goal is to create a sustainable statewide network of health care providers who use:

- A nationally-recognized definition of HAI.
- A standardized set of indicators that can be integrated with CDC's NHSN web-based reporting tool. Achieving this goal will give Louisiana the information needed to best understand the prevalence of HAI in the state.

Louisiana has 64 parishes (counties) and 233 hospitals of all types in the nine public health regions. Of these 233 facilities, 99 are defined as short-term acute care, and 57 are larger institutions with more than 500 employees each. Our analysis suggests that if four hospitals in each region report to NHSN this should be a representative sample of the state's inpatient activity.

We will therefore target a similar number of hospitals in each region to participate in the project by its second year (our first year goal is to have one hospital in each region reporting via the NHSN.). This approach is achievable and sustainable. In addition, it will provide for a regionally dispersed selection of participants, thus allowing for our field staff to maximize the time they spend with each participating provider by limiting travel time.

By the end of this grant period, the goal is to have expanded this sentinel surveillance network to 40 hospitals. Efforts will be made to obtain a representative sample of hospitals throughout the state and to include rural areas of the state that are geographically isolated.

OPH will work with our partner organizations (Louisiana Health Care Review, Louisiana State University Health Sciences Center, the Louisiana Hospital Association and the Louisiana Rural Hospital Coalition) to recruit the necessary hospital providers to the project.

In a further development, other health care facilities will be included.

- Long Term Acute Care Facilities
- Ambulatory Surgical Centers
- Nursing homes
- Out-Patient Diagnostic Facilities

Incentives for obtaining hospital participation:

Funding – This grant will allow us to provide field staff to the interested hospitals. Through our partnership with the state QIO, we will be able to hire two additional staff members that will work onsite at the participating hospitals. These infection control specialists (modeled on LHCR’s quality improvement specialist positions) will be able to conduct the NHSN training for the selected hospital staff.

Early Adoption – A key factor in obtaining hospital support will be the education about the federal government’s desire to require use of the NHSN reporting system in the near future. We will use this as an incentive to identify providers who are interested in voluntarily becoming an Early Adopter. LHCR’s onsite experience with hospital staffs will be invaluable in selecting and recruiting hospitals based on their knowledge of the corporate culture and leadership of these institutions.

Legislation – We will also work in partnership with the medical community to draft legislation that would mandate this reporting. We understand that there will be resistance to any legislative mandate, however, we have a high level of confidence that by first establishing a functional advisory group, honoring the group’s input and building trust, that we can work together to create an approach that is acceptable and achieves the necessary goals.

3.5-The infections to be monitored are:

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)

And secondarily:

Mediastinitis following Coronary Artery Bypass Graft (CABG)

Certain Orthopedic Procedures

Bariatric Surgery for Obesity

Only Methicillin-Resistant *Staphylococcus aureus* Infections (MRSA) invasive cases are reportable

In order to track, measure and report programmatic and fiscal activity and the economic impact of this project, we will develop the appropriate measures for the selected infections that we have proposed to conduct the surveillance activities (MRSA, surgical site infections, ventilator-associated infections and bloodstream infections).

The simple measures that we would use would be the total number of infections, the infection rates and the number of infections prevented.

The economic impact of the project would be determined by using published data about the average cost of HAI and then calculating an economic savings based on the number of HAI that were prevented.

Calculate the number of HAI.

Track the reduction in number of infections.

Calculate savings by reduced # of HAI times average cost per infection.

3.6-Laboratory support

3.6.1-Laboratory Information Management System

The Louisiana Office of Public Health Laboratory is in the process of installing a Laboratory Information Management System (LIMS) in all four of its laboratories. When the implementation is completed, the LIMS will be used for all clinical and environmental testing in the OPH Laboratory; with the exception of newborn screening.

LIMS will improve the Laboratory's ability to track samples, document all quality control (QC) and quality assurance (QA) activities, bill customers for services and generate summary reports for use by the laboratory and its clients. LIMS has the ability to send reports automatically by fax or e-mail once testing is finalized. It also has the capability to send reports to multiple entities.

Included in the LIMS implementation is a web-interface module that allows submitters to order tests electronically and generate barcode labels for samples. This eliminates the need for paper requisitions. It also allows submitters to check on the status of laboratory samples, obtain results when testing is completed and print hard-copy reports. The reports are in a pdf format, and can be saved electronically or e-mailed. This module is currently being used by more than 20 OPH Health Units and a few non-OPH clients.

LIMS was successfully used during the recent novel H1N1 influenza outbreak to send reports by fax to over 100 submitters throughout the State. It was also used to generate various reports in real-time for DHH management.

3.6.2-Electronic Laboratory Reporting

Electronic Laboratory Reporting (ELR) is already in place and plans to expand are underway. The acceptance of electronic data from OPH's extensive network of partners (hospitals and labs) continues to be done by an ad-hoc approach. The data received is reviewed and relevant reports are entered in RDD or the appropriate database. Electronic Laboratory Reporting has been tested in IDRIS and will be continued with IDRIS.

OPH currently accepts, processes, and routes LabCorp, Specialty, Mayo, ACL, ARUP and Quest electronic HL7 messages containing laboratory content.

OPH continued to work with electronic messaging partners to collect electronic data, map local codes to LOINC and SNOMED, and expand the implementation of ELR to other partners. Outreach to smaller microbiology laboratories will be necessary. The smaller laboratories may have to continue using faxes until their systems are upgraded.

3.6.3-Expanding laboratory reporting requirements and confirmatory laboratory testing of select pathogens

Louisiana laws require mandatory reporting of laboratory results suggesting the existence of a reportable infectious disease. Amendments to the list of reportable test results are made by rule making.

Adding mandatory reporting of lab results that could indicate a HAI will be necessary and become part of

the plan.

The accuracy and relevance of NHSN-reported data can only be established only by on-site inspection of policies, procedures and records. Staff within the Office of Public Health, in conjunction with our QIO partner, will be available to conduct both scheduled and impromptu site visits.

The OPH State Lab is equipped and already conducts confirmatory testing. Our plan will be to expand the confirmatory testing. The Pulse Field Gel Electrophoresis (PFGE) laboratory at the OPH Laboratory has generated and analyzed PFGE patterns since 2007.

3.6.4-Improving Hospital Discharge Data

Hospitalization surveillance is based on the Louisiana In-patient Hospital Discharge Data (LaHIDD). In 1997 the Louisiana legislature mandated the reporting of hospital discharge data. LaHIDD serves as the state registry containing hospital discharge data submitted to the Department of Health and Hospitals (DHH). The Office of Public Health (OPH) is responsible for making the data available to OPH sections as needed.

The Infectious Disease Epidemiology Section uses these data sets for the surveillance of infectious diseases in hospitals. The data is available with a delay of two years. The database includes about 400,000 to 500,000 hospitalizations per year. The data give a fair representation of the hospitalizations in the state.

In 2007, IDES compared the number of lung cancer cases in the LaHIDD database and the number obtained from the Louisiana Tumor Registry to find that 87% of lung cancer cases were captured in LaHIDD (some cases go out of state for treatment). This data contains some information that could be of interest for HAI surveillance. Preliminary student projects have demonstrated that data could be used but an effort needs to be made to ensure more complete classification of HAI.

Although the data are two-years old, they have the advantage to cover all hospitals. Assessing the completeness and accuracy of HAI reports in LaHIDD will be a first step.

4-Communication

Communications will also be central to our efforts to recruit more hospitals into the network of facilities that participate by using the NHSN tool. The communications efforts will include the following:

- Web site – The OPH web site for Infectious Disease Epidemiology will be the central source of HAI project information.
- Email Listservs – OPH maintains an active and up-to-date email listserv for all hospital infection control staff.
- Louisiana Morbidity Report – This quarterly publication reaches all health care providers in Louisiana and is a trusted source of information.
- Louisiana Health Information Network – This site is run by the Louisiana Hospital Association. LHIN is a statewide all payer data sharing program which provides participating hospitals access to the most current, comprehensive patient-level data. This data is collected for Inpatients, Outpatients and Ambulatory Surgery patients. LHA-member hospitals of all sizes use the LHIN.
- Louisiana Hospital Inform – This is another site operated by the LHA that serves as a user resource for information on Louisiana hospitals. The site provides quality data on surgical site infections, 30-day mortality and the most common causes of hospitalization: heart attack, congestive heart failure and pneumonia.
- News articles in local publications, radio, TV – When appropriate, news releases and other public information will be distributed through the traditional news media.

An HAI Communications Plan will be developed and implemented; with the goals of:

- Increasing public awareness for HAI and how citizens can learn more about efforts to prevent these infections.
- Empowering consumers with information and tools that will enable them to become aware of, and advocate for, the prevention of HAI.
- Assist healthcare professionals to better understand the scope and severity of HAI, and provide them with the tools and techniques to reduce and prevent these infections.
- Demonstrate progress in achieving the established reduction and prevention metrics.

5-Sustainability

This HAI program will be viewed as a core activity and responsibility of IDES. To sustain the surveillance and preventive activities in infectious disease control, the relationship between IDES and health care facility personnel is of utmost importance. Including a HAI prevention program makes sense and justifies the continuous involvement of IDES.

OPH will bring together a core group of committed organizations and individuals and encourage them to pursue the challenges of continuous improvement and sustainability, and second, effectively communicating with all stakeholders and beneficiaries of improved care. The core group of this collaborative will include:

- Multidisciplinary State Plan Advisory Group (described earlier in Activity A)
- State agencies (DHH-OPH, Department of Insurance) Public Health Community (local health departments where applicable, Louisiana Public Health Institute, Medical Schools)
- Hospital Organizations and Associations
- Physicians organizations
- Representative organizations for ambulatory surgery centers and long term acute care facilities.

6-Grant report and progress monitoring

Summary Reports will be developed that track the goals and objectives of the Project. The first report will provide details about our efforts to recruit hospitals to participate. The report will list:

- All hospitals in the state
- Key contacts
- Current surveillance activities
- Willingness to report via the NHSN
- Barriers to reporting via the NHSN
- Plan to address/overcome barriers

The second report will be designed to track, measure and report programmatic and fiscal activity and the economic impact of this project. We will develop the appropriate measures for the selected infections that we have proposed to conduct the surveillance activities (MRSA, surgical site infections, ventilator-associated infections and bloodstream infections).

The simple measures that we would use would be the total number of infections, the infection rates and the number of infections avoided.

The economic impact of the project would be determined by using published data about the average cost

of HAI and then calculating an economic savings based on the number of HAI that were prevented.

Calculate the number of HAI.

Track the reduction in number of infections.

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Once it is developed, OPH will utilize the targets and metrics identified in the State HAI Prevention Plan to develop aggregate data, provide data analysis and form evidence-based conclusions regarding the prevalence, burden and cost of HAI in Louisiana.