Regional Syndromic Surveillance
Data Sharing Workshop

HHS Region 6
Workshop Report

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Executive Summary

Data sharing is key for situational awareness. Sharing syndromic surveillance data and best practices between jurisdictions increases public health’s ability to monitor cross-border outbreaks, as well as to perform day-to-day surveillance activities. Communicating across jurisdictions not only facilitates concrete data sharing but also increases knowledge, skills, and abilities in syndromic surveillance methodologies. However, there are existing barriers to successful inter-jurisdictional data and information sharing, many of which occur because of a siloed public health environment and limitations in workforce capacity.

To address some of the factors that impede successful inter-jurisdictional data sharing, and to facilitate inter-agency relationships, the International Society for Disease Surveillance (ISDS) and Charles Ishikawa & Associates, LLC, in partnership with the Association for State and Territorial Health Officials (ASTHO), and with funding from the Centers for Disease Control and Prevention (CDC), designed a Workshop for public health officials to discuss inter-jurisdictional data sharing at the HHS regional level. This Workshop, held in April 2014 in HHS Region 6, provided a forum for state and local public health practitioners from Arkansas, Louisiana, New Mexico, Oklahoma, and Texas to discuss their syndromic surveillance practices, systems, and analyses.

The 22 Workshop participants worked together over 2-days to build skills in syndromic surveillance practice, examine and share best practices in syndromic surveillance methods, develop action steps for establishing inter-jurisdictional data sharing, and foster peer-to-peer collaborations in a regional network of surveillance professionals. Day 1 of the discussion was centered around a data sharing activity to grow knowledge, skills, and abilities in syndromic surveillance methodology. For this activity, participants broke into two groups to explore both influenza-like illness (ILI) and gastrointestinal illness (GI). On Day 2, participants broadened their discussion to talk about the benefits and barriers to data sharing, as well as potential outcomes to overcoming those challenges to share data with one another.

By the conclusion of the Workshop participants had increased their syndromic surveillance capabilities in data processing, data analysis and interpretation, communicating syndromic surveillance information, and data quality assurance. The largest gains occurred in data processing skills, most likely due to extensive group conversations regarding age group trends in the syndromes of interest. The Workshop also facilitated a direct conversation about the need for expanded data sharing. All participating jurisdictions agreed that regional data sharing is both vital and possible.

Overall, the evaluation of this Workshop emphasized that the ISDS and ASTHO Data Sharing Workshops present a unique opportunity for public health practitioners to meet others in their region, interact face-to-face, and develop a realistic action plan for continued sharing of public health surveillance data and best practices.

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1 Region as defined by the U.S. Department of Health and Human Services
<http://www.hhs.gov/about/regionmap.html>
Background

Syndromic surveillance\(^2\) systems provide public health practitioners with the ability to maintain situational awareness, detect outbreaks in a timely fashion, and observe geographical trends of disease. These core functions of public health often occur as siloed functions within individual jurisdictions. However, there are vast benefits to communicating about syndromic surveillance systems and patterns with other jurisdictions, particularly on a regional level. These potential gains vary from increased knowledge of a neighboring state’s influenza-like illness to concrete increases in syndromic-related skills and abilities.

Sharing data and best practices between jurisdictions increases public health’s ability to monitor cross-border outbreaks as well as to perform day-to-day surveillance activities. Establishing communication networks between jurisdictions helps ensure that if there is, for instance, a gastrointestinal illness outbreak on a state border the two states will be regularly checking in with one another. In a less urgent situation, sitting down with other epidemiologists allows practitioners to discuss their data, their common analyses, and their methods of reporting. All of these details are important aspects of effective public health communication and practice, and collaborative efforts in these areas lead to better, more efficient practice.

Though best practices are easily shared through discussion, sharing data is simplified when a system is in place to facilitate standardized, easily accessible sharing. One system in particular, BioSense 2.0, provides an effective platform for sharing data between U.S. state and local public health jurisdictions and CDC. When public health data is available and coupled with accessible technology, the act of data sharing has the added potential to influence policy, data quality, response activities, and restrospective analyses that improve public health practice\(^3\).

Even with the known benefits of sharing data and practice, and platforms such as BioSense 2.0, there barriers to effective data sharing remain. Logistical barriers may include not knowing who to call in another state, a result of lacking inter-jurisdictional collaboration and communication. On a practical level, many public health practitioners do not prioritize data from outside jurisdictions when time is limited.

To address some of the factors that impede successful inter-jurisdictional data sharing, and to facilitate inter-agency relationships, the International Society for Disease Surveillance (ISDS) and Charles Ishikawa & Associates, LLC, in partnership with the Association for State and Territorial Health Officials (ASTHO), and with funding from the Centers for Disease Control and Prevention (CDC), designed a Workshop for public health officials to discuss inter-jurisdictional data sharing at the HHS regional level\(^4\). Two prior Workshops in May 2013 and February 2014


\(^4\) Region as defined by the U.S. Department of Health and Human Services [http://www.hhs.gov/about/regionmap.html](http://www.hhs.gov/about/regionmap.html)
successfully established long-term cooperation between regional jurisdictions in HHS Regions 1 and 5, increasing knowledge, skills, and abilities in syndromic practices, and facilitating information sharing.

This Workshop in HHS Region 6 focused on two different syndromes--influenza-like illness and gastrointestinal illness. The two syndrome focus allowed participants to discuss the syndrome that most affects their daily work, ensuring effective and applicable workforce development. Additionally, the dual-syndrome approach led to rich conversations as participants worked with syndromes they consider in daily practice. The Workshop focused on workforce development by increasing data sharing and facilitating increased knowledge, skills, and abilities in a wide range of surveillance sectors.

**Workshop Description**

The Region 6 Syndromic Surveillance Data Sharing Workshop (Workshop) was held on April 8-9, 2014 at the Tarrant County Public Health Department in Fort Worth, TX. Details regarding the Workshop timeline, agenda, participant list, and assessments are located in Appendix A.

The project was managed by Becky Zwickl, MPH with direction from Laura Streichert, PhD, MPH (ISDS), and the Workshop planning and activities were facilitated by Charlie Ishikawa, MSPH (Charles Ishikawa & Associates, LLC.), under contact to ASTHO, who also participated in planning (Scott Gordon, PhD). Tarrant County Public Health made an in-kind contribution of facilities for the Workshop and RTI International provided technical support for BioSense 2.0-related work.

**Public Health Participants**

Workshop participants came from all five states in HHS Region 6. The participating jurisdictions were: Arkansas, Louisiana, New Mexico, Texas, Tarrant County (TX), Harris County (TX), City of Houston (TX), and Oklahoma City-County (OK) (Table 1). These agencies maintain or use systems with varying syndromic surveillance capabilities, and were at different stages in adopting BioSense 2.0 technologies. Regardless of differences in surveillance capabilities, all the jurisdictions perform or have access to a core level of syndromic surveillance data and analyses that made their participation in the Workshop possible.

**Table 1: HHS Region 6 Participants**

<table>
<thead>
<tr>
<th>HHS Region 6</th>
<th>Participating Jurisdiction(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>• Arkansas Department of Health</td>
</tr>
<tr>
<td>Louisiana</td>
<td>• Louisiana Office of Public Health</td>
</tr>
<tr>
<td>New Mexico</td>
<td>• New Mexico Department of Health</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>• Oklahoma City-County Health Department</td>
</tr>
</tbody>
</table>
| Texas        | • Harris County Public Health and Environmental Services  
• Houston Department of Health and Human Services  
• Tarrant County Public Health  
• Texas Department of State Health Services |
In addition to the participants, personnel from the CDC, ASTHO, and the BioSense Redesign Team at RTI were present during the Workshop as observers.

**Objectives and Target Outputs**

The objectives of the Workshop were to have participants:

1. Build skills in syndromic surveillance practice.
2. Examine and share best practices in syndromic surveillance methods.
3. Develop action steps for establishing inter-jurisdictional data sharing.
4. Foster peer-to-peer collaborations in a regional network of surveillance professionals.

Outputs targeted for development during the Workshop included:

1. Actionable next steps for continuing the inter-jurisdictional cooperation.
2. Applied and evaluated analysis plans for condition of interest.
3. Prioritized methodology of syndromic surveillance for conditions of interest.

Unlike for the past two Workshops, participants in region 6 decided to focus on two different conditions of interest, gastrointestinal illness (GI) and influenza-like illness (ILI), instead of a single condition.

**Workshop Approach**

A non-formal education approach was used to plan and conduct the Workshop. Non-formal education is especially applicable in Workshops such as this one where adult professionals can actively engage in the learning process and extract information to meet their priority needs.

Workshop staff worked with participants to identify a regional surveillance priority that would benefit from data sharing. The Workshop consisted of two activities (See Appendix A for full agenda):

1. **Data Sharing** – Participants worked to identify best practices in influenza-like illness (ILI) surveillance using regional health center visit data with an aim of better understanding the practical considerations associated with data sharing (e.g., the effect of jurisdictional differences in syndromic surveillance data collection and analysis on data interpretation and response).
2. **Planning for Future Sharing** – Participants worked with the Workshop facilitator to document the benefits, barriers, and solutions to sharing health center visit data among jurisdictions in HHS Region 6 and with the CDC.

**Workshop Evaluation**

**Evaluation Approach and Methods**

Workshop processes and outcomes were assessed using the CDC evaluation framework. The evaluation had three main objectives:

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**Objective 1:** Measure change in participant knowledge and skill in syndrome-based surveillance methods and technologies due to Workshop participation. As a result of Workshop-associated activities...

- What epidemiological, statistical, and/or business knowledge did participants gain?
- What epidemiological, statistical, and/or business skills did participants gain?

**Metrics**

- Pre- and post- Workshop assessments measuring syndromic surveillance knowledge and skills in the following task areas: Data quality; data management; data processing; statistical analysis; data interpretation; data reporting processes; and public health business practices.
- Document and describe Workshop outputs related to syndromic surveillance science and practice.

**Objective 2:** Describe the participants’ perceptions of changes in their ability to establish syndromic surveillance data sharing due to Workshop participation. As a result of Workshop-associated activities...

- What knowledge did participants gain that may aid in establishing data sharing agreements?
- What resources did participants acquire that may be used in establishing data sharing agreements?

**Metrics**

- Pre- and post- Workshop assessments measuring beliefs regarding data sharing and barriers to establishing data sharing agreements.
- Document and describe Workshop outputs related to syndromic surveillance data sharing.

**Objective 3:** Focus on continuous quality improvement for future Syndromic Surveillance Data Sharing Workshops by assessing...

- What actions should be taken to maximize future Workshop quality?
- What were the tasks and resource utilizations for planning and convening the Workshop?

**Metrics**

- Tasks and person-hours to plan, prepare, convene, and report on the Workshop’s findings.
- Materials and services used to plan, prepare, convene, and report on the Workshop’s findings.
- Participant perceptions of venue, planning, communication, preparation, and facilitation quality.

Information gathered from the pre- and post- Workshop assessments was analyzed using Excel. Quantitative analyses included calculations of:

- Average change in knowledge, skills, and abilities, per category;

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• Median change in knowledge, skills, and abilities, stratified by level of experience with syndromic surveillance practice and methodologies; and
• Questions with most total gain in knowledge, skills, and abilities, per category.

Qualitative data were reviewed by staff and facilitators, discussed, and, where applicable, will be addressed in future Workshops.

**Workshop Results**

Table 2 describes the artifacts developed by participants and facilitators during the Workshop.

**Table 2: Documents and artifacts developed during the Workshop**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lessons learned from Workshop planning and preparation</td>
<td>Lessons and/or observations that participants gained while planning and preparing for the Workshop</td>
<td>Appendix B – Workshop Notes</td>
</tr>
<tr>
<td>Activity #1 Products</td>
<td>Practices in influenza-like illness (ILI) surveillance, including: common business practices; potential changes to BioSense 2.0 classifier; and factors influencing ILI visit data interpretation</td>
<td></td>
</tr>
<tr>
<td>Day 1 Reflections</td>
<td>Participant thoughts at the conclusion of Day 1, looking to Day 2</td>
<td></td>
</tr>
<tr>
<td>Activity #2 Products</td>
<td>Summary of discussion surrounding barriers and possible solutions to data sharing</td>
<td></td>
</tr>
<tr>
<td>Next Steps</td>
<td>Participant-generated ideas for actions following the Workshop</td>
<td></td>
</tr>
</tbody>
</table>

**Participant Knowledge and Skill**

Change in participant knowledge and skill in syndromic surveillance due to the Workshop was measured using an inventory of syndromic surveillance work areas. Immediately before and after the Workshop, participants were asked to rate their knowledge, skills or ability in the following work areas:

1. Data processing  
2. Data analysis and interpretation  
3. Communicating syndromic surveillance information  
4. Data quality assurance

In comparing pre- and post-Workshop skill inventory measurements, each point of change represents either a small growth (positive points) or a small decline (negative points) in a given area of knowledge, skill, or ability per person. For example, a 1 point positive change could indicate a change from “I know about/can do this” to “I know about/can do this well enough to train someone else”. A 1 point negative change could indicate a change in the opposite
direction, from “I know about/can do this well enough to train someone else” to “I know about/can do this”. Due to technical difficulties at the start of the Workshop, only 8 of the participants completed both the pre- and post- Workshop assessment.

The cumulative change in knowledge, skills, and abilities for 8 participants was:

- Data processing – 30 points (6 questions)
- Data analysis and interpretation – 36 points (10 questions)
- Communicating syndromic surveillance information – 18 points (4 questions)
- Data quality assurance – 26 points (5 questions)

Participant responses were broken down by category and by level of experience, i.e., beginner, intermediate, and advanced. Beginner, intermediate, and advanced rankings were assigned based on three factors: years of experience working in syndromic surveillance; mastery of syndromic surveillance methods; and mastery of syndromic surveillance classifier development. All information was self-reported by participants.

Figure 1 shows the change in knowledge, skills, and abilities recorded by participants as a result of attending the Workshop. The largest change occurred in the area of Data Analysis and Interpretation (4.7 points per question). The smallest change occurred in the area of Data Processing (1.83 points per question).

**Figure 1: Change in the knowledge, skills, and abilities of Workshop participants (N=8 participants)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing</td>
<td>0.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Analysis &amp; Interp.</td>
<td>0.6</td>
<td>0.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Communication</td>
<td>1</td>
<td>1.3</td>
<td>-0.1</td>
</tr>
<tr>
<td>Quality Assurance</td>
<td>1</td>
<td>0</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Specifically, Figure 1 shows large gains in the ability to communicate syndromic surveillance information among beginner and intermediate participants. For advanced participants, the largest gain occurred in analysis and interpretation.

Self-perceived changes in competency due to Workshop participation are mainly attributable to the discussions that participants had around either the Day 1 data sharing activity or in making plans to advance regional data sharing in Day 2. In each of the areas assessed before and after the Workshop, discussions of the following topics may have advanced participant learning:

**Data Processing Knowledge**
- Infants and older adults are at greatest risk for both ILI and GI (generally)
- BioSense 2.0 classifier showed slightly different trends in some age groups, but not all, than home grown classifiers

**Data Analysis and Interpretation Knowledge**
- Geographical distribution of patients
- Geographic resolution that is needed for proper analysis (i.e., zip codes may be needed rather than larger geographical regions)
- BioSense 2.0 classifiers for both GI and ILI are more sensitive and less specific than home classifiers
  - Affects counts associated with patient visits but not necessarily epi curve
- Standardized age groups are important for comparing across regions

**Communicating Syndromic Surveillance Information Knowledge**
- Jurisdictions share data with infection preventionists, emergency managers, other health departments, schools
- Benefits of establishing a standardized regional report

**Data Quality Assurance Knowledge**
- Is it ideal to use a BioSense 2.0 classifier that is standardized, but less specific, or to use home grown classifier that provides more accurate picture of trends for that jurisdiction?
- Percentage of ED visits due to GI/ILI is more useful metric than counts
- Account for denominator through weighting method
- Sending data from health departments back to hospitals (i.e., closing feedback loop) should increase quality of data

For additional analysis and a detailed breakdown of knowledge, skills, and ability gains, see Appendix C.

**Inter-jurisdictional Data Sharing**
Over the course of the Workshop, many participants discussed their desire to share data through BioSense 2.0. In particular, participants from the Tarrant County Public Health Department offered to help the participant from Oklahoma City-County Health Department in establishing a connection to BioSense 2.0. Participants felt that having a common sharing mechanism was key to successful data sharing.
Participants also discussed developing a regional report that would present information on GI and ILL in a condensed, standardized way. A regional report could provide a picture of ILL and GI in the area but would also include an interpretation of data and graphs by the contributing jurisdiction. This addresses some potential data quality assurance issues that can result when one jurisdiction interprets another jurisdiction’s data.

Overall, both data and information sharing were discussed at length as a net benefit to ILL and GI surveillance activities.

**Logistics and Facilitation**
Workshop participants were satisfied with the Workshop facilitation and logistics. Based on their feedback, future Workshops can be improved by: Increasing the length of the Workshop; better clarifying specific numerators and denominators for pre-work to decrease confusion and time investment of participants; and assessing the familiarity of participants with key contextual information (e.g., BioSense program history, and Meaningful Use). If needed, facilitators may want to provide additional context for discussion of Meaningful Use and BioSense 2.0. More detailed data is provided in Appendix C.

**Discussion**
The Region 6 Data Sharing Workshop provided a unique opportunity to observe two groups working on the same questions, but with different syndromes. Allowing the participants to participate in either the ILL or the GI group was beneficial in several ways. First of all, it allowed participants to choose a task that directly related to their everyday work, thus decreasing the workload and time commitment. It also allowed everyone to work on analysis tasks that interest them and align with their jurisdictional needs. Finally, the split tasks provided a unique view of how beneficial data sharing can be, regardless of the task at hand.

Regarding the quantitative analysis, the Region 6 Workshop focused much more heavily on communicating syndromic surveillance information than did past Workshops. One possible explanation is that the groups spent some time discussing what a sample regional report would look like for both ILL and GI. By specifically sitting down to discuss what analyses and data they would share with one another participants had a chance to consider the importance and methods of communication.

Finally, this Workshop had more participants than the past data sharing Workshops (22 participants versus 10-15 in past Workshops). The size led to a more involved conversation in some ways since there was a wider depth and breadth of interests and experiences. However, with future Workshops, ISDS and ASTHO would prefer to host smaller groups to encourage deeper inter-jurisdictional discussion and ensure each participant is able to provide comments in the large group conversations.

**Conclusion**
Participants of the Region 6 Workshop plan to take concrete steps towards increasing inter-jurisdictional data sharing, including expanding the use of BioSense 2.0. These steps were
facilitated by the structure of a 2-day, in-person Workshop and have continued through teleconferences and email conversations in the weeks following. A good portion of the Workshop focused on specific activities designed to build trust and understanding between public health jurisdictions; this trust continues to serve as the building block for continued data and best practice sharing.

This Workshop demonstrated the importance of bringing people together in one room to work through problems and barriers and to develop solutions. The importance of in-person collaboration was especially apparent among the Texas participants, many of whom noted that though they work in the same state they rarely have the opportunity to see work together face-to-face. The Region 6 Workshop provided participants with a broader perspective of syndromic surveillance processes and skills and led to a continuing collaboration to share best practices, information, and data.

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7 Region 6 participants have held 2 teleconferences since the end of the Workshop. One was a follow-up with the whole group and the other was specifically to work towards developing a standardized regional report on GI activity.