December 2017

Welcome to NSSP Update

NSSP Update is published monthly by the National Syndromic Surveillance Program (NSSP) and brings you the latest news about the BioSense Platform. To learn more, visit the NSSP website. Link to more resources via the Syndromic Surveillance Community of Practice Portal.

NSSP Progress Toward Transitioning Legacy Data

The NSSP Team continues to move data from the legacy system to ESSENCE. By mid-November, more than 80% of the legacy sites had been moved into the production environment.

Of the 43 legacy sites, 16 have data available in production ESSENCE, and an additional 19 are ready to load data into ESSENCE. Of the remaining 8 legacy sites, 5 are reviewing data in the staging environment, and 3 are being converted to staging.

Thank you for your continued patience throughout the legacy transition. If you have specific questions about your site, please contact the NSSP Service Desk.

Technology Update

ESSENCE. The NSSP Team is still testing the new version of ESSENCE (v1.21). This version offers an access control system to improve system performance and enables new levels of data sharing and improved graph overlay functionality. Users will be able to define and query multiple text fields when building free-text queries (not just chief complaint, CC/DD, or triage note alone) and view data details (line list) of more than 5,000 records.

AMC. To complement the release of ESSENCE version 1.21, some cosmetic changes are being made to the Access & Management Center (AMC) interface, and a new feature is being added to allow site administrators to grant access to RStudio and Adminer without submitting a Service Desk ticket.

New to NSSP Data Flow: Calculated Patient Class Updates and Supporting ESSENCE "Has Been" Flags

We heard you! Thanks to input from the syndromic surveillance community, we enhanced the NSSP data flow. Look forward to—

- Efficient querying for emergency, inpatient, and outpatient visits
- Updated, newly posted Data Dictionary that reflects ESSENCE enhancement

This enhancement required delving into the underlying nuances of the incoming Patient Class data to refine the related Calculated Patient Class algorithm. Plus, we updated the NSSP data flow and retrospective data to support new algorithm rules. Consequently, ESSENCE now contains refined Calculated Patient Class History fields and "has been" flags.

"Under-the-Hood" Enhancement. Here's how the updated NSSP data flow supports ESSENCE "has been" flags:

- Scan the list of standard values stored in Calculated Patient Class History to create "has been" columns:
    - If "E" is found, "Has Been Emergency" (*HasBeenE*) would be set to 1 (Yes)
    - If "I" is found, "Has Been Inpatient" (*HasBeenI*) would be set to 1 (Yes)
    - If "O" is found, "Has Been Outpatient" (*HasBeenO*), would be set to 1 (Yes)
- Incorporate "has been" flags as part of the cubes to enhance query speed.

Result: User may query "Has Been Emergency" values of "Yes" (for example) to identify ED visits for any combination of Patient Classes reported for the visit that had Emergency Patient Class among the Patient Classes reported.
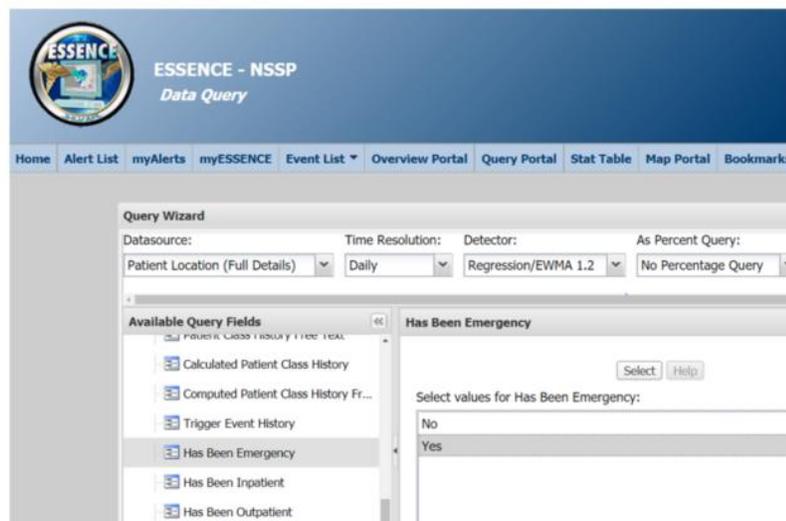
*Screen shot of new "has been" field—one of many available query fields in ESSENCE.*

Data Dictionary Updates. The August and October issues of *NSSP Update* describe the refinements made to the Calculated Patient Class algorithm.

Archive_Processed Tab

- Updated C_Patient_Class to reflect the refined Calculated Patient Class algorithm

- Added Message_Date and Arrived_Date that contain the date portion of Message_Date_Time and Arrived_Date_Time (These indexed fields help when querying NSSP-processed data.)
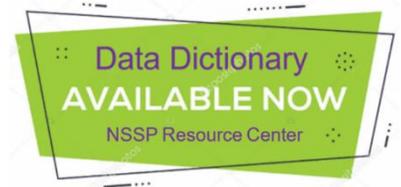
ESSENCE Tab

- Added "has been" fields: *HasBeenE, HasBeenI, HasBeenO*
- Updated various fields with details about what is *displayed* versus *stored*: *c_patient_class_list, c_patient_class_updates, patientclasslist, and patientclassupdates*
- Updated *Sex* to account for "N" value (not reported)

Exceptions_Reason

- Updated definitions include exceptions codes for processing legacy data:
  - 13   Missing MSH4_Sending_Facility (legacy only)
  - 98   Site-confirmed facility exclusion (legacy only)
  - 99   PHIN MS site-confirmed facility exclusion (legacy only)

💡 ESSENCE Tip: Auto-Query Tool Simplifies Free-text Queries

As epidemiologists start to use ESSENCE, they're often excited to try advanced features such as customized queries. However, they don't always have time to visit the query portal and learn the syntax. To bridge this gap and enable new ESSENCE users to quickly create free-text queries, epidemiologist Zach Stein of the Kansas Department of Health and Environment created the ESSENCE Auto-Query Tool (EAQT)—a name he says accurately conveys why epis have careers in data science, not in product naming and branding. The EAQT does what the name suggests: it is a fillable spreadsheet that takes key terms and diagnosis codes and automatically combines them into language that ESSENCE understands.

The EAQT comes with basic instructions. The EAQT spreadsheet can accommodate up to 20 key terms, with up to 5 "AND" terms and 20 "ANDNOT" negation terms for each. After the spreadsheet is completed, the "Output String" can be copied and pasted into the free-text field in ESSENCE. The EAQT has been incredibly useful in Kansas as a teaching tool. The [tool] is posted on the Community of Practice website (login required), and comments and revisions are encouraged.

Epidemiologist Zach Stein of the Kansas Department of Health and Environment created this tool to help others in Kansas who use ESSENCE. Zach shared the tool with the community on November 1, 2017, during the Syndrome Definition Committee's monthly call.

We continue our series of articles examining literature that advances the practice of syndromic surveillance. This month's article is about the use of syndromic surveillance during extreme cold, which might prompt epidemiologists to evaluate the temperature thresholds being used to inform public health alerts.

Characterizing the Effects of Extreme Cold using Real-time Syndromic Surveillance, Ontario, Canada, 2010–2016[1]

The authors begin by acknowledging that "chaotic weather patterns" associated with climate change can produce not only extreme heat but extreme cold. Citing Cohen et al [Artic amplification warming phenomenon][2] and Gasparrini et al,[3] the authors write that Gasparrini "determined cold was responsible for a substantially higher proportion of deaths than heat." This makes a compelling case for understanding the relationship between exposure to cold and adverse health effects—even death.

The relationship between temperature and health is influenced by a confluence of factors (e.g., a person's age, duration of exposure, amount of precipitation). Thus, the authors looked at weather conditions and visits to emergency departments—*all in real time*—to understand the relationship and get a better idea about when to issue health alerts and do emergency planning.

Hospital ED data were collected by the Acute Care Enhanced Surveillance (ACES) system that is used in Ontario. (ACES includes data on people with different socioeconomic backgrounds and insurance types due to Canada's universal healthcare system.) The authors detail their comparison of C1, C2, and C3 algorithms of increasing sensitivity to detect aberrant ED visit counts and generate alerts. Then they launch into a comprehensive analysis of the alerts being generated and present their results.

The bottom line is the importance of choosing an alerting algorithm that *minimizes* false alerts. This paper describes a thorough process for doing just that and demonstrates how better alerts can improve public health warnings associated with cold weather.

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[1]VanStone N, van Dijk A. Chisamore T, Mosley B, Hall G, Belanger P, Moore KM. Characterizing the Effects of Extreme Cold Using Real-time Syndromic Surveillance, Ontario, Canada, 2010–1016. *Public Health Reports* [Internet]. 2017 July/August [cited 2017 Oct 30];132(1 Suppl):48S–52S. Available from: http://journals.sagepub.com/doi/full/10.1177/0033354917708354#articleCitationDownloadContainer

[2]Cohen J, Screen JA, Furtado JC, Barlow M, Whittleston D, Coumou D, Francis J, Dethloff K, Entekhabi D, Overland J, Jones J. Recent Arctic Amplification and Extreme Mid-latitude Weather. *Nature Geoscience* 2014;7(9):627–37.

[3]Gasparrini A, Guo Y, Hashizume M, Lavigne E, Zanobetti A, Schwartz J, Tobias A, Tong S, Rocklöv J, Forsberg B, Leone M, De Sario M, Bell ML, Guo YL, Wu C, Kan H, Yi SM, Coelho MS, Saldiva P, Honda Y, Kim H, Armstrong B. Mortality Risk Attributable to High and Low Ambient Temperature: A Multicountry Observational Study. *Lancet* 2015;386(9991):369–75.

UPCOMING EVENTS

December 6, 2017	Data Validation Support Call: 3:00–4:00 PM ET
December 19, 2017	Scheduled vendor patches in staging environment: 6:00–10:00 AM ET
December 21, 2017	Scheduled vendor patches in production environment: 6:00–10:00 AM ET
January 30–February 2, 2018	ISDS 2018 Annual Conference. Global Health Today and Tomorrow: *Policy Options and Scientific Solutions*; Orlando, Florida
February 27–March 1, 2018	NSSP 2018 Annual Recipient Meeting: **Maintaining and Advancing Syndromic Surveillance** (formerly the Grantee Meeting); Atlanta, Georgia
April 17–20, 2018	Preparedness Summit; Atlanta, Georgia

*Note. To access the Surveillance Community of Practice group resources, you must be signed in to your healthsurveillance.org account. To create an account, click here.

LAST MONTH'S TECHNICAL ASSISTANCE

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November 1, 2017	Data Validation Support Call
November 14, 2017	Scheduled vendor patches in staging environment
November 16, 2017	Scheduled vendor patches in production environment

Since 2016, the community and NSSP Team have worked to improve what's at the core of the BioSense Platform—its data quality and data flow. As a result, the NSSP has a much improved data flow that accounts for variations in feeds and attempts to ensure data are as complete as possible. Also, thanks largely to the community, we have a robust Master Facility Table (MFT) that accurately reflects the facility type(s) used for identifying emergency facilities, registered facilities that send syndromic surveillance data to the BioSense Platform, and facilities with which NSSP has established relationships. Taken together, **the NSSP can now account for facilities, data feeds, and state participation in ways that were difficult to imagine two years ago**.

An accurately defined MFT and improved data flow (in use since 2016) provide opportunities to explore alternate approaches for estimating data representativeness. Coupled with the use of data from the American Hospital Association, we are in a good position to refine the baselines for measuring and reporting NSSP participation. In the next few months, we will inform you on our progress.

On the basis of estimations that *precede* the new data flow, NSSP receives data from more than 4,000 facilities. Of these, about 2,100 are emergency departments (EDs) that actively submit data, which means that about 60% of all ED visits in the country are being represented (based on American Hospital Association data). At least 55 sites in 45 states participate in NSSP. Although NSSP is pleased with participation to date, **sites with data in production do not always translate into sites with broad ED coverage**.
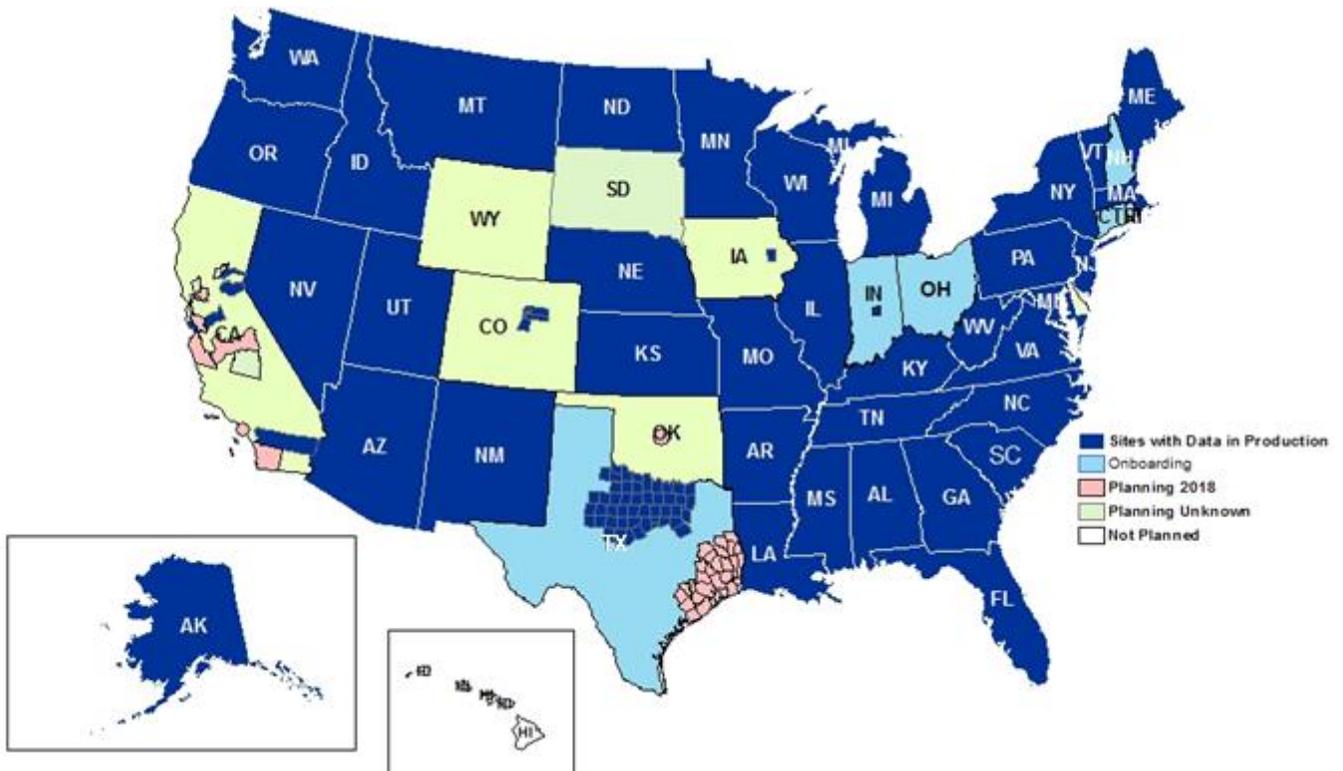
Definitions: NSSP consolidates facilities that provide data under a single data administrative authority called a *site administrator*. These facilities and single-site administrator constitute a *site*.

Fall Onboarding

New site onboarding activities concluded November 17, 2017, for Connecticut, Indiana, New Hampshire, Ohio, Rhode Island, and Texas. These sites have successfully completed the required activities and are preparing to send production data to the BioSense Platform.

Data Validation Support

Conference calls are held the first Wednesday of each month, 3:00–4:00 PM ET, to assist with data validation compliance. For more information, contact the NSSP Service Desk.

Get Ready to Collaborate!

NSSP's 2018 Annual Recipient Meeting—Maintaining and Advancing Syndromic Surveillance—will be held in Atlanta on **February 27, 2018–March 1, 2018**. Through presentations, roundtable discussions, and hands-on training, participants will learn how to improve the nation's situational awareness and respond to hazardous events and disease outbreaks. In addition, Rear Admiral Michael F. Iademarco, MD, director of the Center for Surveillance, Epidemiology, and Laboratory Services (CSELS), will meet with funding recipients to answer questions.

Registration and hotel information have been emailed to funding recipients. If you did not receive this information, please contact your project officer. We look forward to another successful annual meeting!

*State and local public health authorities receive funding through CDC-RFA-OE15-1502: Enhancing Syndromic Surveillance Capacity and Practice.

Tennessee Monitors Population Changes for Hurricane Emergency Management Support

In late summer 2017, the United States endured two severe hurricanes back to back. Although Tennessee was far from the eye of the storms, state health officials knew residents from Texas and Florida could choose to shelter in Tennessee.

In preparation for the influx of evacuees, Tennessee health officials used ESSENCE to monitor out-of-state patients seeking emergency healthcare. Syndromic data was the only information source capable of rapidly collecting health data on out-of-state patients. State health officials monitored the volume
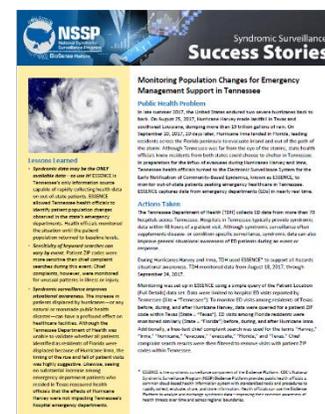
of out-of-state ED patients in Tennessee, assessed the impact on its healthcare system, and identified geographic or hospital-specific spikes in out-of-state patient visits.

To learn more and find out how the Tennessee Department of Health set up its queries to monitor visits among residents of Texas and Florida, please visit Success Stories on the NSSP website.

Tarrant County Public Health Engages SyS Users via Texas Community of Practice

The need for a dedicated Community of Practice. Syndromic surveillance (SyS) is not new to North Texas. For years, Tarrant County Public Health has used ESSENCE to conduct SyS. Currently, 95 hospitals contribute more than 50,000 HL7 messages per day to the NSSP BioSense Platform. Hospital participation in the 49-county region is growing, and data quality continues to improve.

North Texas contains several of the fastest growing cities in the nation, mainly in the ever widening Dallas–Fort Worth metropolitan area. More residents equals more lab reports, more outbreaks, and more disease investigations each year. Any health department budget would be hard pressed to keep up with this population growth with a proportionate increase in staff. The promise of new, improved SyS surveillance brings more capabilities and more *responsibilities*—which might be viewed as a mixed blessing. Surveillance of such a large area brings opportunities to share data, ideas, and knowledge.

> THE LONGER WE DO THINGS THE SAME WAY, THE HARDER IT IS TO OVERCOME INERTIA.

To facilitate data sharing and build on the momentum of growth, Office of Public Health Informatics Manager Bill Stephens asked one of his newer staff members, Scott Mize, to launch and conduct training for a **Community of Practice (CoP)**. The training would target epidemiologists in North Texas local health departments and be conducted during quarterly jurisdictional workgroup meetings.

Training the epidemiologists. To develop relevant CoP training, Scott, a former epi with the Texas Department of State Health Services (region 2/3), drew from his own experience to confront barriers that might prevent local health departments from integrating SyS into daily practice. He wanted to convey that ESSENCE, and systems like it, are not designed to replace surveillance that detects mostly small, localized outbreaks. SyS is, rather, meant to be a useful addition and do what lab results and phone interviews cannot. Further, *SyS is not a new set of work duties* on top of the surveillance already being done.

Scott viewed ESSENCE as a powerful tool that complements other types of surveillance, and that's what he wanted to convey to epidemiologists so that they would have a better understanding of how SyS fits into daily practice. "The longer we do things the same way," Scott said, "the harder it is to overcome inertia. The way surveillance is done locally can have a lot of inertia behind it. For those of us who work with SyS data every day, we must remind ourselves that barriers still prevent epidemiologists, and other health department staff, from using SyS to its full potential."

To replicate his own learning process in a one-day class, Scott structured the Community of Practice training to—

- Work with real (sometimes messy) visit-level data, not just aggregated data, allowing participants to see what information in a map, table, or time series actually represents;
- Use real-world scenarios so that epidemiologists could apply ESSENCE data to the investigation and response; and

- Promote ongoing discussion around uses of SyS data among local health departments.

Launching the Texas Community of Practice. Tarrant County Public Health kicked off the first in-person CoP Training on October 31, 2017. Scott, who will oversee the CoP, invited Program Manager Michael A. Coletta (NSSP), who gave an overview and explained CDC's role in supporting the SyS community. Then Scott led basic ESSENCE training—navigation of system dashboard, queries (free text, time series, maps, reports, etc.), and My ESSENCE sharing queries. HIE Data Quality Project Manager Girish Shelke discussed the flow of information from hospital records to ESSENCE and explained how data quality is measured and corrected. NSSP Health Scientist Aaron Kite Powell discussed the practicalities of integrating ESSENCE into daily work—offering examples of how CDC and state and local health departments use data, including for disaster surveillance. Aaron suggested tips, tricks, and shared lessons learned. The one-day training concluded with a question and answer session and use demonstrations drawn from situations proposed by attendees.

Maintaining the Texas Community of Practice. To date, Tarrant County Public Health has hosted one of three in-person CoP trainings scheduled in different parts of the health region. Post-class surveys are being collected to gauge what participants liked or didn't like. Once training is completed in early 2018, Tarrant County Public Health will conduct periodic webinars or phone conferences so that epidemiologists in region 2/3 will have a forum in which to share ideas and lessons learned. Discussion topics will include response protocols, best-practices, issues, new project ideas, and use cases. Even if new SyS users begin with modest and infrequent use of ESSENCE, hearing how other health departments are using this application will hopefully spur their curiosity to explore further.

[Scott Mize](#) *may be contacted directly for a course outline and presentation materials.*

Washington's SyS Program Advances Strategies and Activities to Strengthen the Practice of Syndromic Surveillance

Data Validation. The Washington State Department of Health's syndromic surveillance program redesigned its data validation protocol and is reaping the benefit of more structure and partial automation of processes. The program's goal is to increase geographical representativeness. Already, the collection of validated clinic data has increased from 0 to more than 300 urgent care, specialty care, and primary care clinics. In addition, Washington is developing R-Script so that validation is faster.

Legislative Efforts. The program reported successful progress due to the enactment of legislation requiring all hospital emergency departments in Washington to submit syndromic surveillance data. Legislation was passed with bipartisan support of Washington legislators and good sustained relationships with internal and external public health and public safety partners. Next steps will include direct, targeted engagements with various stakeholders to inform the development of administrative codes to implement the legislation.

> Please share your successes for improving data representativeness; data quality, timeliness, and utility; SyS practice; and the use of SyS data for public health action and response. Simply fill out the [NSSP Success Stories Template](#) and email to us.

Workgroup and Committee Updates

- *NSSP CoP Steering Committee:* Congratulations to the new NSSP Community of Practice (CoP) Steering Committee Chair, **Krystal Collier**. Krystal is the Program Project Specialist for the Arizona Department of Health Services (ADHS) Syndromic Surveillance (SyS) Program and has been an active CoP member since 2012. As the Steering Committee Chair, she is looking for opportunities to champion SyS success stories through collaborative partnerships and engagement activities. She is also looking for methods to share knowledge and resources that will contribute to the CoP.

  We thank **Rosa Ergas** for serving as the Steering Committee Chair for the October 2016–2017 term and for continuing to serve on the Steering Committee as the Past Chair. Rosa worked tirelessly to lead the Steering Committee through its inception and the development of the charter for the NSSP CoP in 2016. Additionally, Rosa worked closely with the International Society of Disease Surveillance (ISDS) to support the rollout of the new healthsurveillance.org website, ensuring that the virtual collaboration spaces would meet the needs of the community members and support enhanced SyS practice. She also worked closely with the ISDS to make the Surveillance Knowledge Repository a central source for locating multiple surveillance-related resources like abstracts, training, and webinars. Thank you, Rosa, for your service and for continuing to be a vital member of our community.

- *The Urgent Care Justification Workgroup* is working on several documents:
  - Submitted Urgent Care Justification abstract to ISDS
  - Working on SyS talking points
  - Working on Urgent Care Best Practices
  - Working on how to create a urgent care jurisdictional facility list
  - Seeking feedback from the Office of the National Coordinator for Health Information Technology (ONC) and Centers for Medicare and Medicaid Services (CMS) about how urgent care centers that don't meet the *nonemergency* definition of urgent care can participate in SyS and be reimbursed for Meaningful Use. Feedback will be shared with urgent care facilities.

Interested in joining a chapter, committee, or workgroup? You can find a list of the groups here.

Messaging Guide

The syndromic surveillance community met a major milestone in revising the *Messaging Guide for Syndromic Surveillance*! In November, the Messaging Guide Workgroup held the final comment period before HL7 balloting begins in 2018. The Workgroup thanks everyone who submitted suggestions and reviewed comments.

You can still get involved in 2018. If you're interested in contributing, please visit the Messaging Guide Workgroup page to access the working documents and call-in information.

Development of *Messaging Guide for Syndromic Surveillance**	
Time Frame	**Activity**
2015	Version 2.0 Released
2016	Erratum and Clarification Documents Released for Version 2.0
2017 Summer	Version 2.2 Released for Community Comment and Consensus
2017 Winter**	Version 2.3 to be Released for Review and Community Comment
2018 May**	HL7 Balloting Begins
2018 Fall**	HL7 Balloting (anticipated) Completed and HL7 2.5.1 Implementation Guide for Syndromic Surveillance Released

*This document was previously titled *Public Health Information Network (PHIN) Messaging Guide for Syndromic Surveillance.*
**Dates and version numbers were adjusted in October 2017.

Community of Practice Call

This month's Surveillance Community of Practice Call is cancelled. Since April 2017, we have discussed a range of topics—from the use of SyS data in reports to waterborne disease, drug overdose, and disaster surveillance. We look forward to more informative discussions in 2018. Prepare to share your best ideas, resources, and technical assistance with the community!