August 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 Continues to Transition Legacy Data

Loading of legacy data resumed in July. The NSSP Team made steady progress moving data from the legacy system to ESSENCE. The NSSP Team continues to work closely with each site to process data, uphold data quality standards, and maintain program efficiency while meeting the specifications for each site. Thanks for your continued patience throughout the legacy transition. If you have questions about your site, please contact the NSSP Service Desk.

Technology Update

The NSSP Team thanks everyone for their patience during June and July when the servers were upgraded. Already, we've received feedback that queries are running faster.

More improvements are underway:

- Syndromic surveillance experts from Johns Hopkins University–Applied Physics Laboratory continue to monitor and adjust the ESSENCE application and data flows to improve the user experience and processing speeds.
- Password management will soon be easier. The BioSense Platform development team is working to unify the multiple username and password into a *single user password* that will be encrypted and stored in the Active Directory. This long-awaited software release is scheduled for early September. Once the software release is in production, each user will have a single username and password for *all systems* on the BioSense Platform—including the Access & Management Center (AMC), ESSENCE, RStudio Pro, and Adminer. **The AMC will then become the central location for resetting passwords.** When that takes effect, some platform users will be required to change their RStudio Pro and Adminer logins. More details will be provided as we approach the release date.

Semicolons: Prefixing and Suffixing Coded Data to Support ESSENCE Queries

NSSP's ESSENCE application ingests *diagnosis_code* data into the *dischargediagnosis* column. To date, the NSSP data process has prefixed *diagnosis_code* with a semicolon to facilitate queries against the data and to facilitate ESSENCE queries against Discharge Diagnosis. It has come to our attention that an ending semicolon is equally important.

Therefore, we are updating the NSSP data flow so that *diagnosis_code* (NSSP) and *dischargediagnosis* will have a leading and an ending semicolon. We will apply this update to prospective and retrospective data.

In addition, we will update other "coded" data for consistency. Two columns will be updated: *Admit_Reason_Code* and *Chief_Complaint_Code*. (Note. Although *Chief_Complaint_Code* is not ingested into ESSENCE, we are applying this update for consistency across the core coded data elements.)

Stay tuned for announcements on completion of the semicolon updates. If you have questions, please submit a Support Request to the NSSP Service Desk.

NSSP Refines Calculated Patient Class: Future Updates to Algorithm

Current Definition

The NSSP data flow has a calculated field that stores the "best available" Patient Class found in the incoming message. This field is named *C_Patient_Class*.

To date, we've defined the algorithm hierarchy as follows:

- Use the incoming Patient Class (PV1-2) if non-null (using whatever data was reported "as is")
- Else, infer the Patient Class based on the incoming Facility Type (OBX)
- Else, infer the Patient Class based on the Facility Type registered in the Master Facility Table (MFT)

    Note. Inference from Facility Type maps Patient Class code based on a standard facility type value.
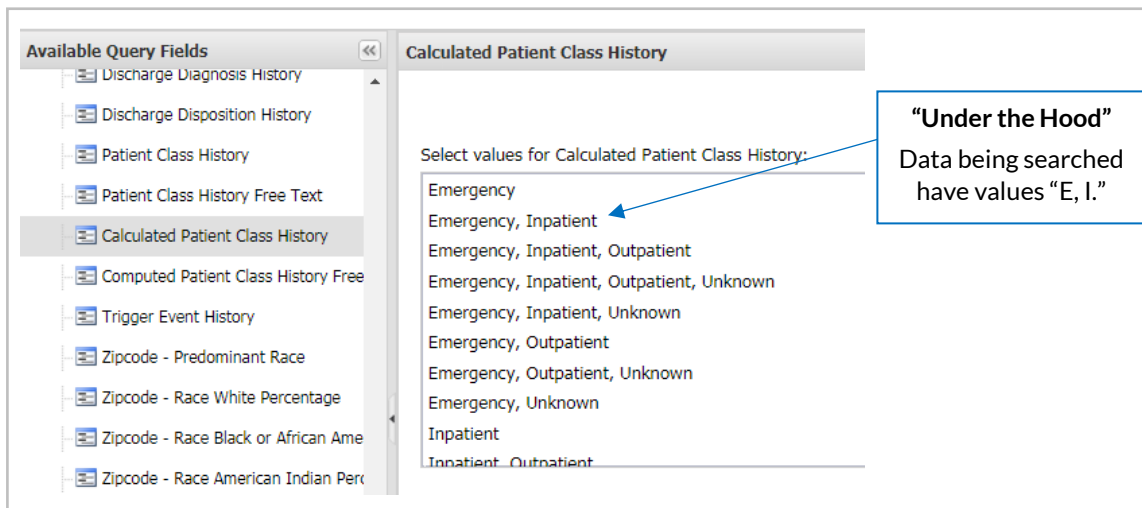
Operational Quality Assurance Findings

As we checked operational quality assurance (QA) against the new NSSP data flow, we discovered that some incoming Patient Class data did not conform with the Patient Class Standard. These incoming data contained nonconforming values that were *descriptions* of Patient Class, not *preferred standard codes*. For example, "Emergency" or "EMERGENCY" was sent instead of "E." Many sites have worked with facilities to adjust their feeds so that incoming Patient Class data adhere to a standard single-character code. However, some issues remain, and, of course, retrospective data does not conform with a standard code.

Trickledown Effect in ESSENCE

In NSSP data, the length of the Calculated Patient Class was set to 3. Accordingly, an incoming value of "Emergency" is stored as "Eme." The negative aspect of this is a trickledown effect on the "history" fields in ESSENCE. Calculated Patient Class History now has a value of "Eme" instead of "E." For this reason, an ESSENCE query using the Calculated Patient Class "drop down" *would not capture visits* with "Eme" (instead of "E") in the Patient Class.

That is, ESSENCE drop-down values are "descriptive" versions of "codes" being searched. For example, a selection of "Emergency, Inpatient" results in a search for "E, I." Thus, visits with values such as "Eme, Inp" are not found.

Available Query Fields	«	Calculated Patient Class History

Available Query Fields:
- Discharge Diagnosis History
- Discharge Disposition History
- Patient Class History
- Patient Class History Free Text
- Calculated Patient Class History
- Computed Patient Class History Free
- Trigger Event History
- Zipcode - Predominant Race
- Zipcode - Race White Percentage
- Zipcode - Race Black or African Ame
- Zipcode - Race American Indian Perc

Select values for Calculated Patient Class History:
- Emergency
- Emergency, Inpatient
- Emergency, Inpatient, Outpatient
- Emergency, Inpatient, Outpatient, Unknown
- Emergency, Inpatient, Unknown
- Emergency, Outpatient
- Emergency, Outpatient, Unknown
- Emergency, Unknown
- Inpatient
- Inpatient, Outpatient

"Under the Hood"
Data being searched have values "E, I."

UPDATED Definition

Calculated Patient Class data were intended to have *pristine* Patient Class data. Such data can facilitate queries and be used to create binary flags in ESSENCE that indicate if the visit was "ever in a specific Patient Class." For example, a flag can indicate if the Patient Class history has "E" somewhere in the history. Binary flags can certainly improve query performance—but *only* if data are pristine.

We talked with practitioners whose sites have feeds that send descriptive Patient Class values. After these discussions and examining the QA findings of incoming Patient Class data, we've decided to make some improvements. We will update the NSSP Calculated Patient Class definition to align with the original intent of having pristine data. Here's how the updated algorithm will be hierarchically defined:

▪ Use the incoming Patient Class (PV1-2) if non-null *and* if the value adheres to the Patient Class Standard

▪ Else, "map" specific nonconforming Patient Class values to a standard value (for example, incoming value of "Emergency" will be mapped to the standard value "E")

▪ Else, infer the Patient Class based on the incoming Facility Type (OBX)

▪ Else, infer the Patient Class based on the Facility Type registered in the MFT

Note. Inference from Facility Type is based on a mapping established to map a Patient Class code based on a standard facility type value.

When applied, both prospective and retrospective data will reflect the updated Calculated Patient Class algorithm. Add to this, your ESSENCE queries leveraging Calculated Patient Class will ensure that you pull Visits of Interest based on your Patient Class *combinations* of interest. And as noted above, this sets the tone to move forward with the ESSENCE "ever in a specific Patient Class" binary fields.

Look for updates on this improvement to Calculated Patient Class in upcoming issues of *NSSP Update*. If you have questions, the NSSP Analytic Data Management Team will be pleased to explain this further. Simply submit a Support Request to the NSSP Service Desk.

NSSP Evaluation of BioSense Platform Tools

To evaluate how well the new BioSense Platform and tools meet users' needs, evaluation staff developed post-transition surveys to capture feedback from sites that transitioned to the BioSense Platform between June and December 2016. These surveys were distributed late July, and we strongly encourage you to respond. Your feedback will help us continue to meet the needs of the syndromic surveillance community. If you have questions, please contact Hussain Yusuf (hay0@cdc.gov) or Sebastian Romano (wwj5@cdc.gov).

We continue our series of articles examining literature that advances the practice of syndromic surveillance. Here, we are pleased to announce a newly published supplement of Public Health Reports *that focuses on the use of syndromic surveillance data.*

Syndromic Surveillance: The Value of Real-time Data for Public Health Action

New articles in the journal *Public Health Reports*[1] demonstrate how syndromic surveillance (SyS) allows health practitioners to improve situational awareness in a variety of settings and for numerous reasons. These 18+ articles describe how SyS is being used for all-hazards public health surveillance, for characterizing health events, and for mass-gathering surveillance here and abroad. This is the first compilation of articles about SyS to be published in recent years. The result is an overview of the novel and increasingly more cost-effective ways in which syndromic data are being used and a glimpse at the future use of real-time data.

The supplement focuses on the use of electronic health record (EHR) data from clinical settings. To use EHR data to inform and monitor health decisions, considerable thought must be put into how data are collected and algorithms designed. Then, of course, one must understand and know how to interpret these data. Experts in SyS frequently refine queries, adjust algorithms, and *question* data to make sure they have a good understanding of what it represents.

The editorial sets the stage by acknowledging SyS as a core component of many surveillance programs, thanks to the proliferation of EHR and advancements in data systems. The reports are categorized into four sections: Enhancing Surveillance Systems, All-Hazards Surveillance, Monitoring Mass Gatherings, and Advancing Surveillance Practice.

Enhancing Surveillance Systems (3 articles)—Read about the history of BioSense—the challenges, lessons learned, and successful evolution into a national program focused on collaboration, data sources, and data quality. Then, head abroad to learn about the United Kingdom's publicly funded, single-payer provider health care system—not to mention its multiple electronic clinical information systems and data formats. Patient care and operational benefits are a driving force behind the United Kingdom's efforts to standardize its software system and to improve the quality of clinical data. Lastly, learn how telephone triage is a promising data source for public health surveillance, particularly infectious and noninfectious diseases.

All-Hazards Surveillance (10 articles)—Read six use cases that demonstrate the value of SyS. Examples include suspected meningococcal disease, asthma exacerbation after a building collapse, and Ebola-like illness in travelers. Three articles describe the use of SyS for temperature-related illness, including one article that demonstrates the value of revising the heat syndrome case definition through inclusion and exclusion criteria. Another article looks at the risk of fall-related injury due to adverse weather events. Other articles describe the use of SyS for active surveillance of potential rabies exposures; use of SyS to monitor psychoactive substance; use of SyS to monitor the increase in opioid overdose; comparison of three methods of heroin surveillance; and use of SyS to detect suicide-related ED visits, which demonstrated the detection value of using both chief complaint data and discharge diagnosis in the case definition.

Monitoring Mass Gatherings (3 articles)—The first article describes mass-gathering epidemiology as an emerging discipline, with electronic SyS being one way to enhance surveillance. The article emphasizes the importance of having a preexisting infrastructure in place. The next two articles describe the use of SyS during mass gatherings. One article describes the Los Angeles County Department of Public Health's proactive use of tagged patient records to customize its SyS system for the 2015 Special Olympics Word Games. The other article describes a risk assessment tool created to monitor specific syndromes during the Pan American and Parapan American Games in Canada.

Advancing Surveillance Practice (2 articles)—The first article states that a national SyS service must be scientifically valid and should be linked to academia. From here, the article launches into a description of the United Kingdom's SyS academic research programs and the implication of these programs on the future of public health, including the value of international partnerships. The second article presents an agenda that could be the catalyst for research in 12 topic areas in 4 SyS categories: informatics, analytics, systems research, and communications.

Without doubt, this supplement of *Public Health Reports* delivers. We strongly recommend that you take time to read the articles, as the breadth of material cannot be summarized adequately. There are take-aways throughout—from redefining SyS as an academic endeavor to presenting a practitioner-driven research agenda for the future of SyS. In many ways, these articles demonstrate that SyS is one of the more exciting and integral components of public health surveillance.

The three guest editors—Paula Yoon (CDC's Division of Health Informatics and Surveillance), Amy Ising (University of North Carolina at Chapel Hill), and Julia Gunn (Boston Public Health Commission)—combined their expertise and experience to deliver a supplement that reflects the best of local, state, and federal public health practice.

[1] Syndromic Surveillance: The Value of Real-time Data for Public Health Action. *Public Health Reports* [Internet]. 2017 July/August [cited 2017 July 25];132(1 Suppl). Available from: http://journals.sagepub.com/toc/phrg/132/1_suppl

UPCOMING EVENTS

| **August 2, 2017** | Data Validation Support Call: 3:00–4:00 PM EDT |
August 15, 2017	Scheduled vendor patches in staging environment: 6:00–10:00 AM EDT
August 17, 2017	Scheduled vendor patches in production environment: 6:00–10:00 AM EDT
August 22, 2017	Surveillance Community of Practice Call: "Summer Surveillance," which will focus on waterborne diseases, drownings, and other summer hazards: 3:00–4:30 PM EDT. Click here to register.

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

July 5, 2017	Data Validation Support Call: 3:00–4:00 PM EDT
July 18, 2017	Scheduled vendor patches in staging environment: 6:00–10:00 AM EDT
July 20, 2017	Scheduled vendor patches in production environment: 6:00–10:00 AM EDT

NSSP receives data from more than 4,000 facilities. Nearly 2,800 of these facilities are emergency departments and urgent care centers, which means that about 65% of all emergency department visits in the country are being represented (based on American Hospital Association data). Currently, 47 sites in 40 states participate in NSSP.
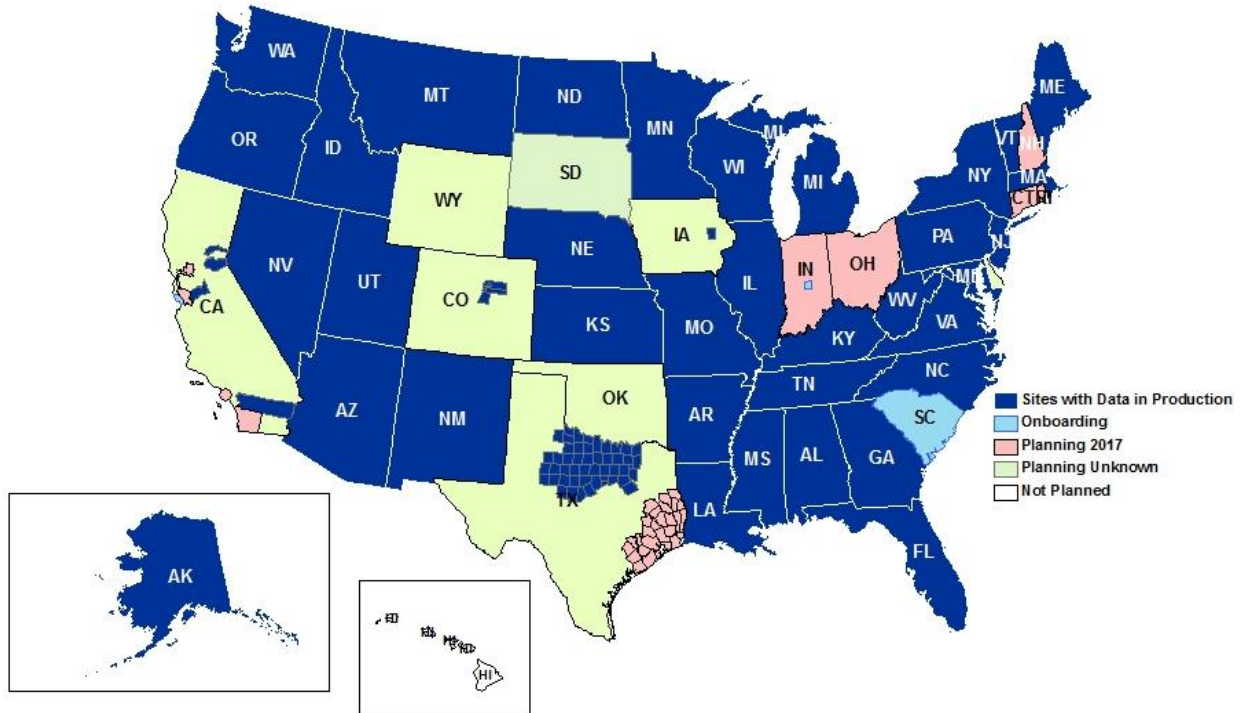
Definitions: NSSP consolidates facilities that provide data under a single data administrative authority called a *site administrator*. These facilities and single-site administrator constitute a *site*.

ONBOARDING UPDATES

Fall Onboarding is Underway!

Onboarding will begin October 3, 2017, and continue through December 15, 2017. NSSP emailed potential sites in late July to determine interest and capacity to onboard this year. Interested sites that could meet the requirements and schedule were asked to reply by August 1, 2017, to be considered for fall onboarding.

The next window for onboarding will be spring 2018.

Data Validation Support

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

Two Unique Syndromic Surveillance Systems
State and Federal Collaboration to Gain a Better Understanding of Anomalies

A recent success story describes how an analyst with the New Jersey Department of Health (NJDOH) collaborated with an NSSP syndromic surveillance (SyS) expert to examine whether anomalies that manifested in one system were observed in the other—and if so, whether these anomalies had any public health significance. NJDOH uses an in-house system to collect, manage, and analyze real-time emergency department (ED) data from acute care hospitals and satellite EDs. NJDOH also sends data to the BioSense Platform and participates in the NSSP.

Each SyS system has its own way of creating syndromes. The analyst and NSSP SyS expert considered the characteristics of each system. For example, the BioSense Platform has different classifications and keyword groups than NJDOH's in-house SyS system.

The take-away here is that analysts with in-house systems who send data to the BioSense Platform have considerably more information at their disposal for making public health decisions. By leveraging data from two systems, analysts can broaden their view of the data and potentially increase the likelihood of making observations that could not have made by using just one system. Such collaboration also gives the NSSP Team a better understanding of state SyS data flow and needs, ultimately improving the BioSense Platform, which helps all system users.

We thank Analyst Teresa Hamby of the New Jersey Department of Health for sharing her time and insights.

The NJDOH success story demonstrates collaboration to understand anomalies observed in two different SyS systems.

NSSP wants to help others succeed. 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.

Kansas Uses Syndromic Surveillance to Monitor Injuries from Fireworks

A recent [press release](#) caught our attention. It was posted by the Office of the State Fire Marshal, Kansas, to remind Kansans of the importance of safety around fireworks. The statistics were drawn from data collected by the Kansas Syndromic Surveillance Program, which detected 144 fireworks-related injuries in 2016.

These findings piqued our curiosity. So naturally, we spoke with the analysts at the Kansas Department of Health and Environment (KDHE), and they graciously offered to share their query. We learned that Kansas *does not* base its numbers on the FireBurnExplosives syndrome. Instead, Kansas uses a combination of the W39 diagnosis code and firework-specific key term query. Here is the query that Kansas uses:

```
^[;/
]W39^,or,^punk^,or,^artillery^,or,^shell^,andnot,(,^fish^,or,^nut^,or,^pistachio^,),or,^bomb
^,or,^sparkl^,or,^grenad^,or,^M80^,ANDNOT,(,^[;/ ]M80^,),or,^M 80^,ANDNOT,(,^M
800^,),or,(,^fire^,and,(,^cracker^,or,^work^,or,^show^,),),or,(,^roman^,and,^candle^,)
```

We ran KDHE's query and looked at the national view of this phenomenon in ESSENCE. As these data show, fireworks-related injuries are significant.

Daily National Level Percent of All ED Visits Associated with Custom Firework Injury Query
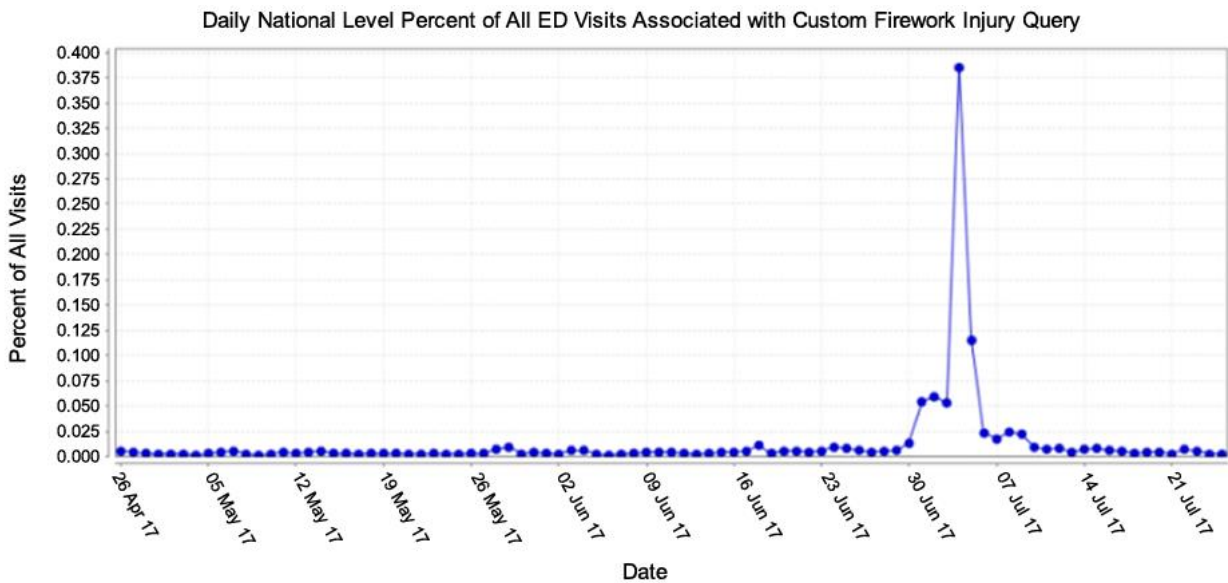
There are other ways to look at national data. For example, one could aggregate counts by week and extend the time frame to include Christmas and New Year's Day. Both occasions are peak times to capture firework activities.

We applaud the Kansas Department of Health and Environment for monitoring fireworks injuries and for distributing safety tips as a public health service. Public health departments serve communities well by monitoring injuries and by promoting appropriate and timely health messages to at-risk populations.

COMMUNITY OF PRACTICE UPDATES

Trending Topics

Opioid surveillance continues to be a trending topic for the Community of Practice. To learn about what community members are doing around opioid surveillance, please visit the community forums.

Work Group and Committee Updates

Exciting news! The Data Quality Committee will hold its first open Quarterly Call on Friday, **September 8, 2017, at 12:00 PM EDT**. Courtney Fitzgerald and Kirsten Hagemann, from Cerner Corporation, will be the guest presenters. Cerner brings together healthcare and information technology. This is an opportunity to learn more about their new system and product for SyS public health reporting. So what

are you waiting for? [Register](#) for the **September call** and join us. Please send your questions to [Jill Baber](#) and [Krystal Collier](#), co-chairs of the Data Quality Committee.

Interested in joining a chapter, committee, or work group? You can find a list of the groups [here](#).

Development of Messaging Guide: Comment Period Extended!

Thank you to everyone who submitted comments on the *Messaging Guide for Syndromic Surveillance*, Version 2.2. the International Society for Disease Surveillance (ISDS) received more than 120 comments on the Guide and is reviewing the feedback in preparation for release of Version 2.3. If you are interested in assisting ISDS with the review of these comments and the development of the next version of the Guide, please join the [Messaging Guide Work Group](#).

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 Spring	Version 2.2 Released for Community Comment and Consensus
2017 Summer	Version 2.3 to be Released for Review
2017 Fall	Version 2.4 to be Prepared for HL7 Balloting
2017 Winter	Version 2.5 HL7 Balloting Begins
2018 January	HL7 Balloting (anticipated) Completed—Version 2.6 Released

*This document was previously titled *Public Health Information Network (PHIN) Messaging Guide for Syndromic Surveillance.*

Community of Practice Call

Please join us for the monthly Surveillance Community of Practice Call. This call brings together various stakeholders with a vested interest in surveillance and sparks collaborative efforts to share guidance, resources, and technical assistance.

The next call will be held **August 22, 2017, 3:00–4:30 PM EDT.** Titled "**Summer Surveillance**," the call will focus on waterborne diseases, drownings, and other summer hazards. Please join us and share what you are doing on this topic. Click [here](#) to register.

Note. To access the slides and recordings from previous Surveillance Community of Practice Calls, please visit the Surveillance [Community](#) of Practice Group Page. You must be signed into your [healthsurveillance.org](#) account. To create an account, click [here.](#)