

NSSP UPDATE



December 2018

People

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COMMUNITY OF PRACTICE UPDATES

The NSSP CoP is growing...

In People

- We have increased NSSP Community of Practice (CoP) membership from 188 members in August 2016 to 540 members in November 2018. The CoP has members in 45 states from various public health jurisdictions. That's almost tripling our membership in just under 2.5 years!
- About 75% of respondents to the [2018 NSSP CoP Member Satisfaction Assessment](#) *agreed or strongly agreed* that membership in the NSSP CoP builds trust, rapport, and a sense of community. With over 200 community, workgroup, and committee calls hosted, opportunities abound within the NSSP CoP to network and collaborate with others.
- *"I like the community of practice because its peers share with peers. Everyone seems like 'equals,' and there is great collaboration."*

—NSSP CoP Member

In Knowledge, Skills, and Abilities

- More than 90% of members report that participation helps them stay current in syndromic surveillance (SyS) through the monthly call, meetings, and webinars—not to mention the 175 additional webinars and training resources available in the [Surveillance Knowledge Repository](#).
- The Surveillance Knowledge Repository hosts more than 2,000 surveillance-related resources with over 30,000 page views to date. This includes the 40+ syndromes available in the [Syndrome Library](#). These resources are available at no cost to the NSSP Community and has led to almost 90% of members stating that membership in the NSSP CoP has improved their SyS knowledge, skills, and abilities. The [ESSENCE Online Training Course](#) alone has been viewed more than 2,200 times!
- *"The CoP is an excellent resource, and I greatly appreciate the tools, networking, and training opportunities it provides."* —NSSP CoP Member

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In Practice

- Due to the tireless work of the [NSSP CoP Message Guide Workgroup](#), the [HL7 2.5.1 Implementation Guide for Syndromic Surveillance, Release 1](#) was included in the May 2018 HL7 ballot with the expectation that this guide will be published by HL7 as a Standard for Trial Use in 2019. **This will be the first time that HL7 has published a standard for the submittal of SyS data.**
- The Standard Vendor Mapping project, developed by the [NSSP CoP Metadata Visualization Application Workgroup](#), produced a list of the top 20 Electronic Health Record Vendors that has been adopted and implemented as drop-down list in the NSSP BioSense Platform's Master Facility Table. The vendor information in the MFT can be leveraged to assess and compare **data quality across vendors**. This new tool provides another mechanism for public health jurisdictions to analyze and assess their data quality within the NSSP BioSense Platform.
- The [Syndromic Surveillance and Public Health Emergency Preparedness, Response and Recovery Committee](#) helps SyS and public health preparedness professionals fully integrate syndromic data and information into preparedness and emergency response. Further, the committee **provides access to a national peer network for ad hoc support or collaboration** during incidents and events of national interest (e.g., extreme weather events, mass gatherings). This network provided surge capacity for states affected by hurricanes during the 2018 Hurricane season.
- The [Overdose Surveillance Committee](#) meetings have become a **prime opportunity to get updates about national opioid efforts, including updates from the Council of State and Territorial Epidemiologists (CSTE) Poison Indicators Workgroup and administrators of funding for Enhanced State Opioid Overdose Surveillance (ESOOS)**. During the calls, group members and guests will showcase how different organizations and public health jurisdictions are tackling the opioid epidemic.
- Almost 70% of members report that being a member of the NSSP Community of Practice *reduces duplication of effort and prevents “reinvention of the wheel.”*

NSSP Community of Practice Call

Please join the monthly NSSP CoP Call. This call is powered by community members who want to share guidance, resources, and technical assistance. The call includes an open forum for discussion and questions. The next call will be held **December 18, 2018, 3:00–4:30 PM ET**, and we will discuss **winter surveillance**. Click [here](#) to register for the entire call series.

To access [slides](#) and [recordings](#) from previous calls, visit the [NSSP Community of Practice Group Page](#)

2018 Highlights

Community of Practice (CoP)

- Elected NSSP CoP Steering Committee Chair Krystal Collier, Arizona Dept. of Health Services, and Deputy Chair Amanda Morse, Washington State Dept. of Health.
- Administered NSSP CoP Member Satisfaction Assessment May 7–21, 2018, to 197 local, state, and federal members of the NSSP CoP. This assessment collected feedback from members about barriers and challenges to participating in CoP activities and using related tools. To see the results, click [here](#).
- Updated the [NSSP CoP Charter](#).
- Updated the SyS 101 Module ([Syndromic Surveillance Overview: How It Works and How It Is Used](#)).
- Launched the Syndromic Surveillance and Public Health Emergency Preparedness, Response and Recovery (SPHERR) Committee.
- Launched Technical Committee to serve as a conduit between CoP.

Implementation Guide for Syndromic Surveillance

Throughout 2018, the Message Guide Workgroup, ISDS, and CDC collaborated to get the guide ready for the May 2018 HL7 ballot. The guide is slated for publication by HL7 as a Standard for Trial Use in 2019.

HL7 2.5.1 Implementation Guide Milestones	
Time Frame	Activity
2015	Completed Version 2.0 Final RELEASE*
2016	Released Erratum and Clarification Documents for Version 2.0
2017 Summer	Released Version 2.2 Working Draft for Community Comment and Consensus
2017 Winter	Released Version 2.3 for Review and Community Comment
2018 March	Released Version .09
2018 Spring	Submitted DRAFT HL7 Guide for Balloting: Implementation Guide for Syndromic Surveillance Release 1.0 Standard for Trial Use (STU) HL7 Version 2.5.1**
2018 Fall (October–December)	<ul style="list-style-type: none"> ▪ Integrated and Resolved HL7 and Public-provided Comments ▪ Submitted to HL7 for Review***
	<ul style="list-style-type: none"> ▪ Reconcile Comments and Obtain Final Approval from HL7 Public Health Workgroup ▪ 2-week Reposting of Dispositions (Final Voting)
2019 January	<ul style="list-style-type: none"> ▪ Integration of Approved Changes ▪ 2-week Review and Approval of Request to Publish <i>Implementation Guide</i>
2019 February	Submit Request to Publish <i>Implementation Guide</i> as a “Standard for Trial Use”
2019 Spring (March–May)	90-day Publication of <i>Implementation Guide</i> to HL7 Members
2019 June	Release to Public: <i>HL7 2.5.1 Implementation Guide for Syndromic Surveillance for Trial Use Version 1</i>

* Version 2.0 is currently being used; subsequent versions are working drafts only.

** Added April 2, 2018.

*** Resolution of comments from Spring 2018 Ballot Process is on schedule for completion in November 2018.

NSSP Funding Recipients Strengthen SyS Science and Practice

NSSP has many valued partners who continually demonstrate the versatility of syndromic systems and data. Since 2015, the Centers for Disease Control and Prevention (CDC) has funded 28 state health departments and 3 local health departments to strengthen their capacity to conduct syndromic surveillance (SyS) through enhanced staff training and improved surveillance data.

Each year, CDC-funded health departments submit an Annual Progress Report (APR) in response to federal cooperative agreements award requirements. NSSP evaluators examine the APRs for data coverage and quality measures and look for key themes related to each recipient's successes and challenges. These analyses are used to improve the NSSP.

The Year-3 APRs demonstrate that CDC funds are strengthening surveillance systems and practice:

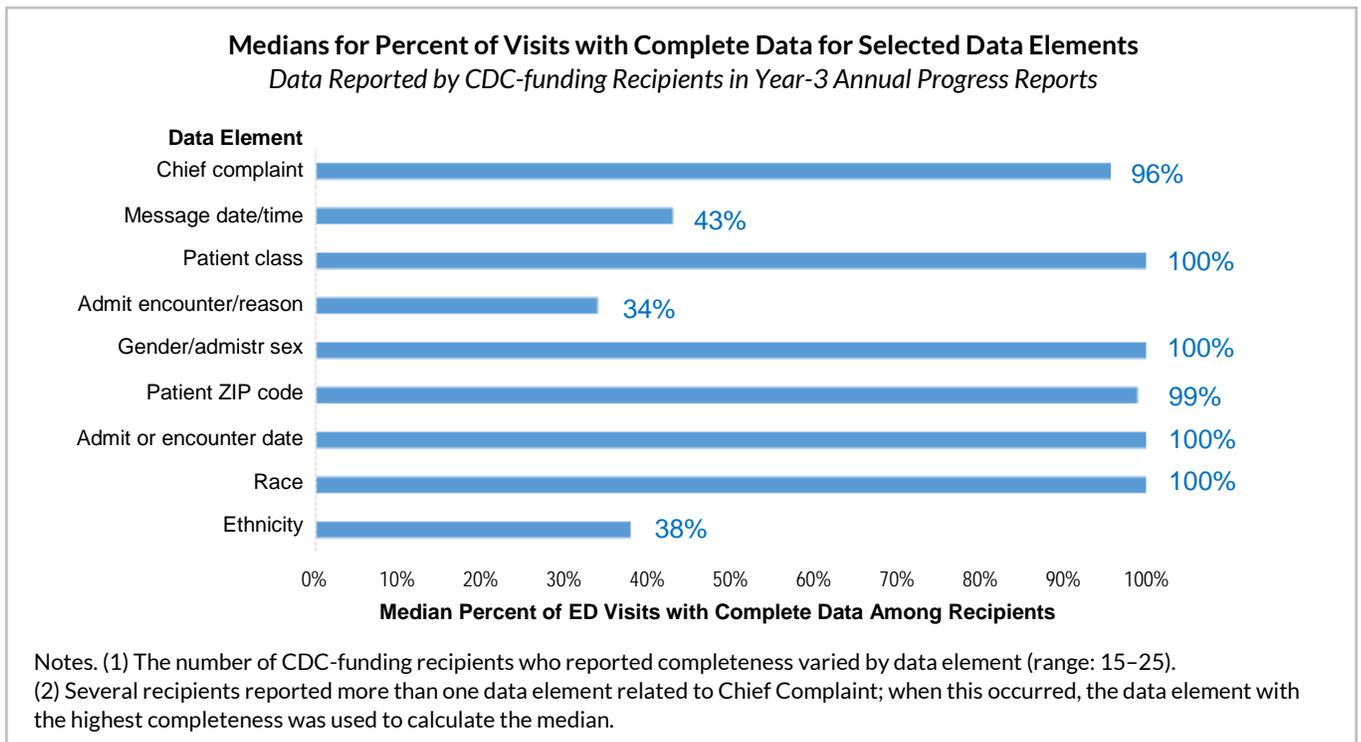
- All funding recipients recruited and onboarded emergency departments (EDs). Year-3 APRs for the 31 recipients indicate that 2,106 EDs currently submit data to the BioSense Platform (range: 10 to 220 EDs per recipient). Since Year-1, this is an increase of 1,538 EDs. Further, several hundred Urgent Care Centers have been recruited to send data.
- All funding recipients added system users. On average, the Year-3 APRs show 22 users per recipient are registered to use the BioSense Platform. This is an increase from Year-1 of about 17 users per recipient.
- Recipients commonly used syndromic data to enhance surveillance of opioid/other drug overdose, conduct influenza-like illness case identification and reporting, and improve situational awareness during emergencies (Hurricanes Harvey and Irma) and other events (solar eclipse, mass gatherings).
- All recipients employed staff who participated in NSSP Community of Practice activities (committees, forums, webinars), developed and shared syndrome definitions, or trained others. The Year-3 APRs show 194 staff across 31 funding recipients took part in professional development activities, which is an increase from Year-2 APRs of 120 staff reported.

2018 Highlights

Partnerships

- In spring 2018, NSSP held its Third Annual Recipient Meeting: "Maintaining and Advancing Syndromic Surveillance."
- CDC and partners led two sessions at the 2018 ISDS Annual Conference (Success Stories Panel, Evaluation Panel).
- NSSP canvassed attendees at the 2018 ISDS Annual Conference to identify their interesting in launching a Regional Epi Group. In late 2018, NSSP began contacting potential participants.
- Work began to integrate NSSP into the Health Information Systems Capacity component of CDC's Epidemiology and Laboratory Capacity (ELC) for Infectious Diseases cooperative agreement.
- NSSP assessed service desk tickets to guide future activities and to assure system users' needs are being met.
- CDC launched the Cooperative Agreement for Emergency Response: Public Health Crisis Response (Opioid Crisis Notice of Funding Opportunity). Seventeen NSSP-funded sites are participating.

- All recipients reported data quality measures in their Year-3 APR, shown below. These measures are essential over the course of the funding period to demonstrate improvement.



Nebraska’s Use of Syndromic Data and Collaboration Enhances Substance Overdose Surveillance

Much of mainstream media is focused on the opioid epidemic. Other substances, however, remain serious public health risks. Data show that most primary drug treatment admissions in Nebraska are related to methamphetamines and amphetamines, followed by marijuana and then opioids. Consequently, the Nebraska Department of Health and Human Services sought to improve its understanding of how substance use and overdose deaths were affecting its communities.

Read about how two highly collaborative pilot projects used syndromic surveillance to characterize substance use and overdose deaths and to guide prevention efforts.



THIS MONTH AND UPCOMING EVENTS

December 4	Webinar: Introduction to SAS Studio Basics on the BioSense Platform
December 4	Scheduled update to BioSense Platform (SAS Studio, SAS URL, Access & Management Center enhancements to support SAS, minor bug fixes)
December 5	Data Validation Conference Call, 3:00–4:00 PM ET. For information, contact the NSSP Service Desk .
December 18	NSSP CoP Call; 3:00–4:30 PM ET; Topic: Winter Surveillance; register here .
December 18	Scheduled vendor patches in staging environment: 6:00–10:00 AM ET
December 20	Scheduled vendor patches in production environment: 6:00–10:00 AM ET
January 29– February 1, 2019	17th Annual International Society for Disease Surveillance Conference: Harnessing Data Science to Improve Population Health and Public Health Surveillance ; San Diego, California

LAST MONTH'S TECHNICAL ASSISTANCE

November 1	Deployed ESSENCE enhancements
November 20	Applied vendor patches in staging environment
November 23	Applied vendor patches in production environment

DATA QUALITY CORNER

Data—the foundation for making sound public health decisions—must be managed from collection through analysis and reporting. NSSP can work with sites to assess and improve data quality. Each month, NSSP provides site-specific reports on three essential and integrated measures of data quality: completeness, timeliness, and validity. Reports can be accessed in each site's secure shared folder and are available toward the end of the month. The Data Quality Corner can help you use these reports to bolster and maintain the integrity of your site's data quality.

Oh My...You Haven't Aged a Bit!

Have you noticed age values of “-1” in ESSENCE detailed data? Now, THAT’S young! Seriously, though, what does this mean?

ESSENCE age-related data are based on NSSP Processed data in C_Patient_Age and C_Patient_Age_Units. The NSSP business rules for age calculation are hierarchically defined as follows:

Calculate the age based on a **valid** birth date and visit date (C_Visit_Date - Birth_Date)

Else

Use Age_Reported/Age_Units_Reported (sent in OBX)

Else

Use Age_Calculated/Age_Units_Calculated (sent in OBX, although *rarely* seen)

This calculation can produce invalid ages in NSSP Processed data when either the birth date or visit date is weird or the age actually reported in the OBX segment is weird. For example, in Processed data in C_Patient_Age, you could see age values of

- NULL (perhaps the birth date reported was NULL or year/month only, making it an invalid date, and no other Age data was reported via OBX);
- Negative values (perhaps due to typo in admit date, making admit date from the early 1900s; or, perhaps due to that being the value actually sent in Age_Reported OBX segment); or
- Very...VERY old ages (perhaps due to typo on birth date making birth date from the 1800s; or, perhaps due to that being the value actually sent in Age_Reported OBX segment).

Basically, as more data become available on the BioSense Platform, we find the content of various age-related columns have outlier values. Outlier age values are NULL and cannot be categorized into ESSENCE age groups used in Table Builder. Consequently, counts tallied by querying detailed ESSENCE data may not match counts generated using Table Builder's data cubes.

To solve this problem, ESSENCE will ingest data by setting the “Age” column to -1 if the following criteria are met: **Age is NULL or <0 or >120**. Further, ESSENCE will categorize an Age value of -1 into the “Unknown” age group to make sure records with NULL age or odd ages are counted.

When you see an Age value of -1 in ESSENCE detailed data, check out the data passed from the Processed table into ESSENCE detailed data: C_Patient_Age, C_Patient_Age_units, C_Patient_Age_source.

You may see a NULL value, negative value, or value >120 years (ESSENCE's cutoff).

Processing rules for the core NSSP Processed data also have checks for outlier values. These checks, however, are *not* the same ESSENCE checks implemented after the Processed data flow was defined.

Currently, NSSP runs a process check looking for instances where the **birth date calculation** produces an age >150. When that occurs, the data process will set the Birth_Date_Time to NULL. This forces the C_Patient_Age algorithm to move down the hierarchy and try to use ages sent in the OBX message including Age_Reported (per current guidelines) or Age_Calculated if Age_Reported was not sent. (Here's a reminder from last month's "No Strings Attached" newsletter article: You can leverage str_birth_date_time in Processed data to determine if a birth date was sent but unable to "convert" to a datetime value in birth_date_time.) Here, NSSP's processing goal is that C_Patient_Age has the opportunity to use Age_Reported if the birth date/visit date calculation was, well, weird.

(Note. The NSSP team has identified "synchronizing age outlier checks" as an item for the CoP Technical Committee to review, along with potential inclusion of string fields in ESSENCE ingestion to help interpret odd age values that might be due to invalid dates.)

SPOTLIGHT ON SYNDROMIC SURVEILLANCE PRACTICE

This article is from a [supplemental issue of Public Health Reports](#) that describes the use of syndromic surveillance to improve situational awareness and enhance the public health response to events that affect population health. This article describes New York City's approach to developing syndrome definitions for monitoring trends in psychoactive drug-related morbidity.

[Developing Syndromic Surveillance to Monitor and Respond to Adverse Health Events Related to Psychoactive Substance Use: Methods and Applications¹](#)



The New York City Department of Health and Mental Hygiene (DOHMH) initially used a couple administrative systems to monitor psychoactive drugs before turning to syndromic surveillance (SyS). SyS was better suited to help public health officials detect emerging health concerns and intervene quickly. Plus the system was flexible. Syndrome definitions could be modified easily, and syndromic data could be standardized, automated, and integrated into daily workflow.

The authors studied hospital emergency department (ED) data from 2012 that included visit dates, chief complaints, ZIP codes, discharge diagnoses, and dispositions. They reviewed the chief complaints to develop 3 categories—overdose, drug mention, and drug abuse/misuse—from which they defined 25 psychoactive drug syndromes. From July 2013 through December 2015, they conducted SyS using these 25 syndrome definitions. They identified instances where SyS supported other public health investigations already identified. Notably, their use of SyS led to *new investigations* and helped them to identify geographic areas where ED visits for synthetic cannabinoid and heroin overdose had increased. (The article includes detailed explanations of the investigations for synthetic cannabinoids and heroin.)

The authors emphasize the value of using syndromic data to inform public health responses and interventions. SyS proves useful both as an early warning system for health departments and as a basis for comparison of overdose across geographic areas. Health departments can also use syndromic data to inform the allocation of healthcare services and staffing for investigations, treatment, and education.

¹Nolan ML, Kunins HV, Lall R, Paone D. Developing Syndromic Surveillance to Monitor and Respond to Adverse Health Events Related to Psychoactive Substance Use: Methods and Applications. *Public Health Reports* [Internet]. 2017 July/August [cited 2018 Nov 28];132(1 Suppl):65S–72S. Available from: <https://journals.sagepub.com/doi/full/10.1177/0033354917718074>

2018 Highlights

A vibrant community of practice (CoP) helped take the NSSP in a new “data flow” direction this year. Members of the CoP worked closely with the NSSP team to drive technical improvements across the BioSense Platform. Our thanks to the community for keeping NSSP focused year-round on results! Here are some examples of our accomplishments:

Technology

- Automated and released the Master Facility Table
 - Pilot tested, usability tested
- Migrated 669 million legacy records
- Enhanced ESSENCE functionality (e.g., free-text queryable field, myESSENCE, MyFilter)
- Conducted spring and fall onboarding; added 3 sites in fall 2018
- Piloted and introduced SAS Studio
- Increased capacity of RStudio application server

Data

- Launched updates to data flow
- Developed vendor-level and parent organization-level data quality (DQ) reports
- Added one-stop shopping completeness reports through “<Site>_Cells” and “<Site>_Cells_Red” worksheets to facilitate review of key DQ findings
- Developed Validity Reports to support Onboarding
- Expanded Onboarding Validation support to include Site Inspectors
- Revamped NSSP *Data Dictionary*, adding Data Flow Enhancements details, flow charts to show logic for key calculated fields, and ESSENCE processing detail (e.g., expanded column descriptions, new Discharge Disposition worksheet)

Publications

- Developed and published:
 - *Quick Start Guide to Using SAS Studio*
 - *Quick Start Guide to Using the MFT*
 - *Data Dictionary: Data Elements Used in NSSP Data Processing Journey*
 - *MFT Data Reference Guide*
 - *NSSP Update* monthly newsletter
- Updated quick start guides: AMC, RStudio, Adminer
- Worked with states to develop 10 success stories
- Launched “Data Quality Corner” and “Questions/Tips” in NSSP Update
- Co-authored: [Vital Signs: Trends in Emergency Department Visits for Suspected Opioid Overdoses—United States, July 2016–September 2017](#)

Collaboration

- Worked with CDC programs so that BioSense Platform users could use the Platform to report to ILINet
- After Hurricane Harvey, provided SyS expertise to Office of the Assistant Secretary for Preparedness and Response (ASPR) Disaster Medical Assistance Teams (DMATs)
- Presented at ISDS 2018 Conference (Jan/Feb)
 - NSSP Data Quality Improvements and Data Comparison Across Sites
 - Evaluation Activities and Successes in the Field
 - HL7 Balloting: *Implementation Guide for SyS*
 - Improved Onboarding
- Collaborated with CDC’s Injury Center on opioid overdose, suicide prevention, and sexual violence
- Presented at Preparedness Summit (April)
- Presented at Public Health Informatics Conference (August)
- Worked with CoP Technical Committee (e.g., NSSP Enhancements Document)
- Participated in joint efforts to introduce and update Chief Complaint/Discharge Diagnosis Categories:
 - Marijuana V1
 - Sexual violence V1
 - Sexual violence V2
 - Leptospirosis
 - All-traffic injury
 - Intimate partner violence V1
 - CDC stimulant V2
 - CDC opioid overdose V2
 - CDC heroin overdose V4
 - CDC all-drug V1

Admin

- Secured new contract vendor to host NSSP’s secure, cloud-based infrastructure
- Secured a new support contract for NSSP

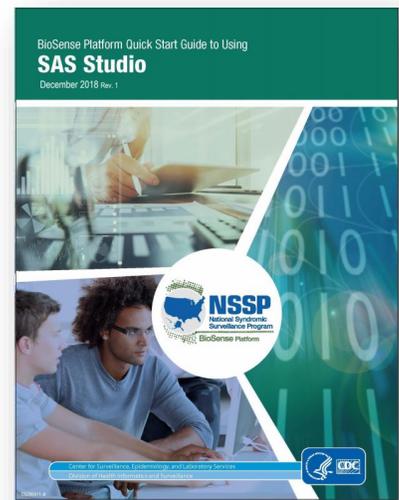
UPDATES

NSSP Releases SAS Studio and Updates AMC

As NSSP brought a most productive year to a close, we put the final touches on the Access & Management Center (AMC) so that system users could readily link to **SAS Studio**. **Both SAS Studio and the AMC were released early in December 2018**. At the same time we released the new AMC, we corrected a few bugs on the Master Facility Table.

Look for these new arrivals in the [NSSP Resource Center](#):

- *Quick Start Guide to Using SAS Studio*—SAS Studio is a customizable, Web browser-based interface for analyzing complex data in graphical format. This guide includes the basics for using your site's data with SAS Studio and will familiarize you with SAS interface, features, navigation, and functionality.
- *Quick Start Guide to Using the AMC*—This update describes how a site administrator can add SAS Studio application access for their users.



NSSP PARTICIPATION

Calculations for Estimating Emergency Department Coverage Revised

In 2014, Coates et. al.¹ reported that the National Syndromic Surveillance Program (NSSP) covered 45% of U.S. nonfederal hospital emergency department (ED) visits across all 50 states, including Washington D.C., based on survey data published by the American Hospital Association (AHA). Since that report, we have streamlined new-site onboarding; improved data collection, management, and reporting; and developed detailed site reports for improving data quality. Given these significant improvements, we revised our calculation for estimating ED visit coverage to use *improved* NSSP data.

Revised Approach

Our revised approach allows for inclusion of all ED facilities that actively contribute to NSSP's BioSense Platform, regardless of their participation in the AHA Annual Survey. We use data from facilities whose primary facility type category is "*Emergency Care*," and we define "active" participants for this estimation as facilities that have reported data within the past 90 days.

First, we calculate annualized ED visits for all facilities that actively submit data. To account for the changing number of facilities actively submitting data (mostly increasing) and for occasional interruptions and fluctuations in data submission, we compute annualized ED visits by calculating the median number of ED visits for each facility during the previous 12 months and multiplying it by 12. This approach minimizes weekly and monthly variability and provides a relatively stable estimate of annualized number of visits for each facility based on data actually submitted to the NSSP BioSense Platform. We use the annualized number of ED visits as the numerator for estimating ED visit coverage of active facilities.

The total number of annual visits for each facility is not readily available for use as a denominator. For facilities that participated in the 2016 AHA survey (the most recent available), we compared the annualized visit count based on NSSP data (described above) with annual number of visits reported in

the AHA survey. The NSSP data showed higher visit counts for many facilities, which may be attributed to multiple factors. We use the larger of the two estimates (AHA or NSSP) for the denominator for these facilities. This approach underestimates our results for some facilities but prevents reporting coverage greater than 100% for other facilities. For facilities that did not participate in the AHA survey, we used the annualized NSSP ED visits for the facility as the denominator, being the only available source of data, although it may overestimate results for some facilities.

To estimate overall ED-visit coverage, we divide the total of the annualized NSSP ED visits by the total estimated ED visits (if both AHA and NSSP data were available for a facility, the higher value was used; if data were available from only one source, that value was used).

Highlights of our revised approach are summarized below:

Foundational Requirements:

- Primary facility is registered as Emergency Care.
- Facility reported visit data within past 90 days.

Numerator:

- Numerator is based on NSSP data.
- Median monthly number of visits are calculated by using previous 12 months of NSSP data and are multiplied by 12 to get a yearly estimate of visits. (Note: Months with no data are ignored.)
- Numerator is calculated for all active ED facilities.

Denominator:

- If the estimated number of annual visits for a facility is available from both NSSP data and AHA data, the *larger* of the two values is used in the denominator.
- If the estimated number of annual visits for a facility is available from only one dataset (NSSP or AHA), the *available* data are used in the denominator.

We believe our revised approach provides the best estimate available at this time. The estimate emphasizes use of data *actually submitted*—rather than self-reported survey data. Further, the estimate uses current-year NSSP data, which are timelier.

Limitations include the use of multiple sources (NSSP data and AHA Annual Survey data), which may define the data elements differently. There is some lag in availability of AHA data, as the most recent data available are for 2016. Further, there may be facilities not included in either AHA data or NSSP data, and the inability to include these visits in the denominator may affect coverage estimates. Unfortunately, we do not know how many facilities or visits could be missing. As we gather larger quantities of high-quality NSSP data, we will revise our approach to further improve the accuracy of this estimate.

Look for new stats on NSSP coverage in upcoming issues of *NSSP Update*. The NSSP coverage estimates will be updated once every quarter starting January 2019. Please contact us if you have questions.

¹Coates RJ, Pérez A, Baer A, Zhou H, English R, Coletta M, Dey A. National and Regional Representativeness of Hospital Emergency Department Visit Data in the National Syndromic Surveillance Program, United States, 2014. *Disaster Medicine and Public Health Preparedness* [Internet]. 2014 February [cited 2018 Nov 1];1(04):1–8. DOI: [10.1017/dmp.2015.181](https://doi.org/10.1017/dmp.2015.181)