Internal Data Validation

Nigel Lewis MPH, CIC

NHSN Protocol and Validation Team

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Learning Objectives

At the conclusion of this session, participants will be able to

- **Define internal data validation and quality data**
- **Identify NHSN internal data validation resources**
- **Describe recommended internal data validation activities**

Internal Data Validation and Quality Data

Types of HAI Data Validation

Internal Data Validation

- **Active efforts by a reporting facility to *assure quality* of NHSN data**
- **Built in as a routine facility process**

External Data Validation

- **Survey and audit process by external agency to *assure accuracy* of NHSN surveillance and reporting**
- **Requires additional resources**

Quality Data

- Complete
- Timely
- Accurate
- Consistent

Why Is Quality Data Important?

- Monitor HAIs and the impact of prevention efforts
- Benchmark performance against risk-adjusted national data
- Fulfill state-mandated and CMS reporting requirements
- Ability to hold up during external scrutiny (external validation by State or CMS)

Internal data validation leads to high quality data.

How does internal validation lead to quality data?

Routine Internal Data Validation

- Identifies systematic weaknesses in HAI reporting
- Assures surveillance data are of high quality
  - Complete, timely, accurate, consistent
- Promotes coordination and partnership building with stakeholders
- Builds confidence in your facility's data

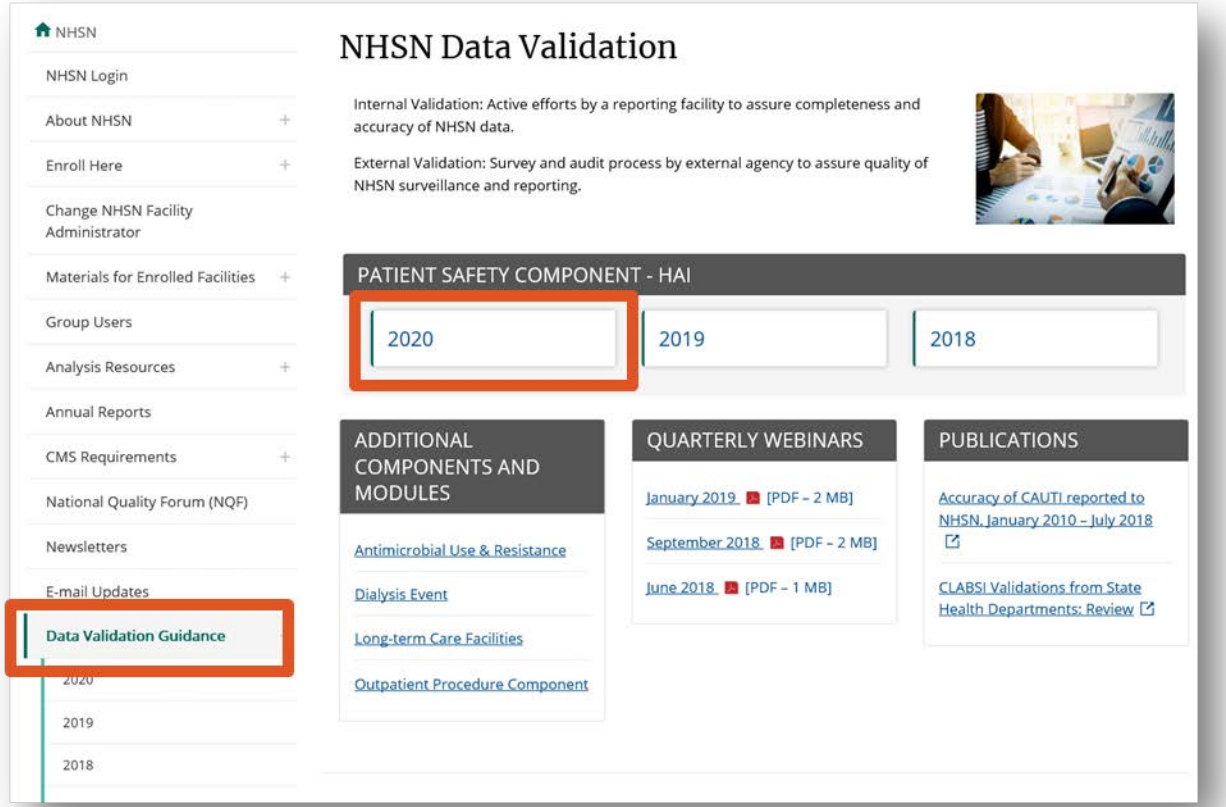
Why Should You Validate Your Own Data?

- NHSN checks for implausible and incomplete data entries
- NHSN application cannot check for
  - Data not captured at the facility level
  - Data that was not entered accurately
- Assures stakeholders of data quality
- These are YOUR facility's data - you may be surprised at what you find!

Internal Validation Guidance

Internal Validation Guidance and Toolkit

https://www.cdc.gov/nhsn/validation/index.html



2020 HAI Internal Validation Toolkit

- Guidance for planning data validation activities
- Data quality survey tools
  - CLABSI/CAUTI Denominator Survey (with key)
  - Surgical Procedures and SSI Surveillance Methods Survey (with key)
  - LabID Event Surveillance Methods Survey (with key)
- Data quality checklist for review prior to data submission

Suggestions for Planning Data Quality Checks

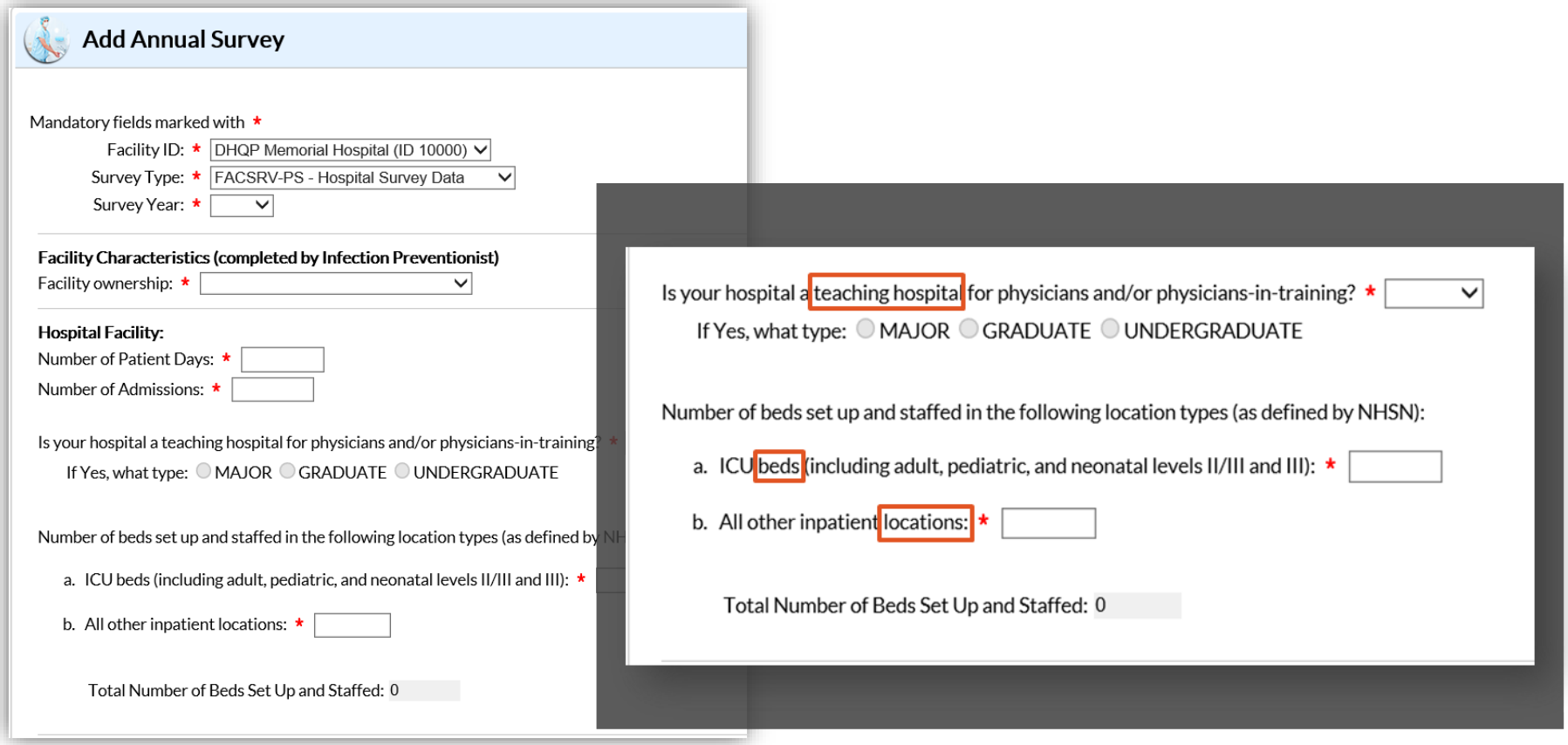
- Annual Checks
- Monthly Checks
- Weekly/Daily Checks
- “As needed” Checks

Suggestions for Annual Data Quality Checks

Annually

- Develop a facility level surveillance and data validation plan
- Determine surveillance program competencies
- Review accuracy of data collection processes and data sources (EMR system, laboratory data, ADT data, OR data, procedure coding)
- Review facility descriptors and location mapping
- Recruit partners
- Assess staff knowledge and training needs

Recommended Annual Check



Data Quality Survey Tools

Appendix C: CLABSI, CAUTI, and VAE Denominator Counting Survey (with Key)

OrgID/Name of Hospital _____ Date of Survey _____

Instructions: *Administer in person or by telephone, directly to individuals responsible for denominator counting. This form is divided into 3 sections for facilities where these tasks are performed by different persons. The first section,* ***PATIENT DAYS****, contains questions applicable to both CLABSI, CAUTI and VAE denominator collection (questions 1-9). The second section,* ***CENTRAL LINE DAYS****, contains questions applicable to CLABSI denominator collection (questions 10-22). The third section,* ***INDWELLING URINARY CATHETER DAYS****, contains questions applicable to CAUTI denominator collection (questions 23-29). The fourth section,* ***MECHANICAL VENTILATOR DAYS****, contains questions applicable to VAE denominator collection (questions 30 – 36).*

Facility OrgID:	Name/ID of individual interviewed:	Position: ☐ IP ☐ Clerical ☐ Nursing ☐ Other (explain)	Interviewer initials:	Date of survey:
(*circle*): CLABSI, CAUTI, VAE	NHSN location(s) covered:			

PATIENT DAYS *(for CLABSI, CAUTI, and VAE denominator counters)*			***Answer Key/Rationale***
1.	How are patient days usually collected? *(choose one)*		*VAE is excluded from once weekly sampling of denominator data*
	Electronically (*document the software system utilized and skip to Q8*):		
	Manually (daily/weekly)		
	Some units electronic and some units manual		
	Comment:		
2.	Is there a specified time when the denominator count is taken?	☐ Yes ☐ No	*The answer should be Yes.*
3.	When is it done?		*Counts should be done at a specific time daily, preferably at nearly the same time throughout the facility to avoid errors when patients transfer.*
4.	Describe the method used to count **patient days**:		*From NHSN: Denominator data (patient days and device days) should be collected at the same time, every day, for each location performing surveillance to ensure that differing collection methods don't inadvertently result in device days being > patient days.*
	Count the number of patients assigned to a unit bed at the same time central line/indwelling urinary catheter/mechanical ventilator counts are conducted		
	Other *(specify)*:		

Annual Check: Manual CLABSI/CAUTI Denominators

Manual daily count or sampled method (once/week)

- Are staff counting correctly
- Missing or implausible data
  - # patient days > # beds
  - # catheter days > # patient days
- Keep denominator logs of % of days in year when
  - Urinary catheter/central line days not collected
  - Patient days not collected
- Internal data validation annually for one week for each location type, with concurrent dual assessment to test for accuracy

Manual to Electronic Counting of CLABSI/CAUTI Denominators

Before you begin submitting electronic denominator counts, validate electronic counts with concurrent manual counts

- Manual counts are considered the "Gold Standard"
- Electronic counts should be within +/- 5% of manual counts for 3 consecutive months
- If the electronic counts are outside the +/- 5% for any month, continue manual counts until 3 consecutive months are achieved
- Work with IT to correct electronic counting problems
- Denominator Validation Template provided in Internal Validation guidance document

Electronic to Electronic Counting of CLABSI/CAUTI Denominators

- **When transitioning from one electronic counting system to another electronic counting system, validate electronic counts with concurrent manual counts**
  - **Manual counts are considered the "Gold Standard"**
  - **Counts for any electronic counting system should match within +/- 5% of manual counts for 3 consecutive months**
- **Current users: conduct spot checks of electronic data to assure continued good performance**

Annual Check: SSI Denominator Data (Procedures)

- **Which NHSN procedures will be reported, inpatient or outpatient, surveillance period (30 or 90 days)**
- **Ensure denominator data are not missed**
  - **Identify all data sources for ICD-10-PCS and/or CPT operative procedure codes**
  - **Cross referencing of multiple sources reduces missing procedure data**
- **Annual (or more frequent) downloads to confirm procedure data from selected days/weeks were not missed during the interval**

Suggestions for Monthly Data Quality Checks

Monthly

- Validate Monthly Reporting Plan
- Conduct data quality checks before submission
  - Missing data (zero patient days, “no events”)
  - Implausible data (device days > patient days, BMI > 200)
  - Outliers (procedure duration < 5 minutes)
  - Incomplete data (SSI event not linked to procedure)
  - Inaccurate data (incorrect date of event)
  - Outstanding NHSN alerts (incomplete event, missing events)
- Review data prior to submission using NHSN Data Quality Checklists

Data Quality Checklists

Appendix I: Data Quality Checklist - SSI Events/Procedures

This checklist is intended to ensure completeness and accuracy of SSI Event and Procedure data entered into NHSN.

SSI Event (numerator)		
Indicator	**Description/Action**	**Validated**
i) All SSI events reported	Verify that all SSI events have been reported. (Go to NHSN Application –> Analysis – Reports –> Procedure-Associated (PA) Module –> SSI –> Line Listing – All SSI Events) **Note:** When generating the All SSI Events line list, choose the Procedure Date (procDate) as the Date Variable on the Time Period tab.	
ii) Missing numerator variables (Incomplete events)	Verify that all mandatory/required data fields are completed. (Go to NHSN Application –> Alerts –> Incomplete Events, Event Type: SSI)	
iii) SSI event is linked to procedure	Verify that SSI event is linked to the correct procedure. (Add Display Variables "linkedproc" to Line Listing – All SSI Events; refer to "All SSI events reported" above.)	

Data Quality Checklists

Appendix H: Data Quality Checklist - MDRO/CDI Data

This checklist is intended to ensure completeness and accuracy of LabID Event data entered into NHSN.

Summary Denominator Data – Validate Monthly/Quarterly		
Indicator	**Description/Action**	**Validated**
iii) Verify denominator data accuracy for all reporting locations. **Note:** For 2015 and forward, FACWIDEIN excludes data reported for rehabilitation wards (IRF) and behavioral health/psych wards (IPF) that have a CCN that is different from the acute care hospital.	Generate Rate Tables to display summary data by location and month/year in a table format. Go to NHSN Application –> Analysis –> Reports –> MDRO/CDI Module – LabID Event Reporting –> All *C.difficile*/(or MRSA) LabID Events –> Rate Tables for CDIF (or MRSA) LabID Data **OR** NHSN Application –> Analysis – Reports –> Advanced –> Summary-level Data -> Line Listing –> All Summary Data **Alternative Method** (this method requires you to search for each location/month/year individually): Go to NHSN Application –> Summary Data –> Find. Select Summary Data Type "MDRO and CDI Monthly Denominator" and enter Location Code, Month, Year.	

Suggestions for Weekly/Daily Data Quality Checks

- Review positive laboratory specimens
- Spot check denominator accuracy
  - Patient days, patient admissions
  - Device days
  - Surgical procedure capture
  - SSI risk-adjustment variables

What Should Trigger “As Needed” Data Quality Checks

- New patient care locations: accurately mapped?
- New data collection staff
- New or modified electronic medical record systems
- Unusual data
  - Was denominator reporting complete?
  - Were all risk adjustment variables entered correctly?
  - Was there a change in testing method (such as CDI testing method)?

Additional Recommendations

Recommended Case-Ascertainment Checks

Validation of case-ascertainment should include periodically reviewing list of candidate cases

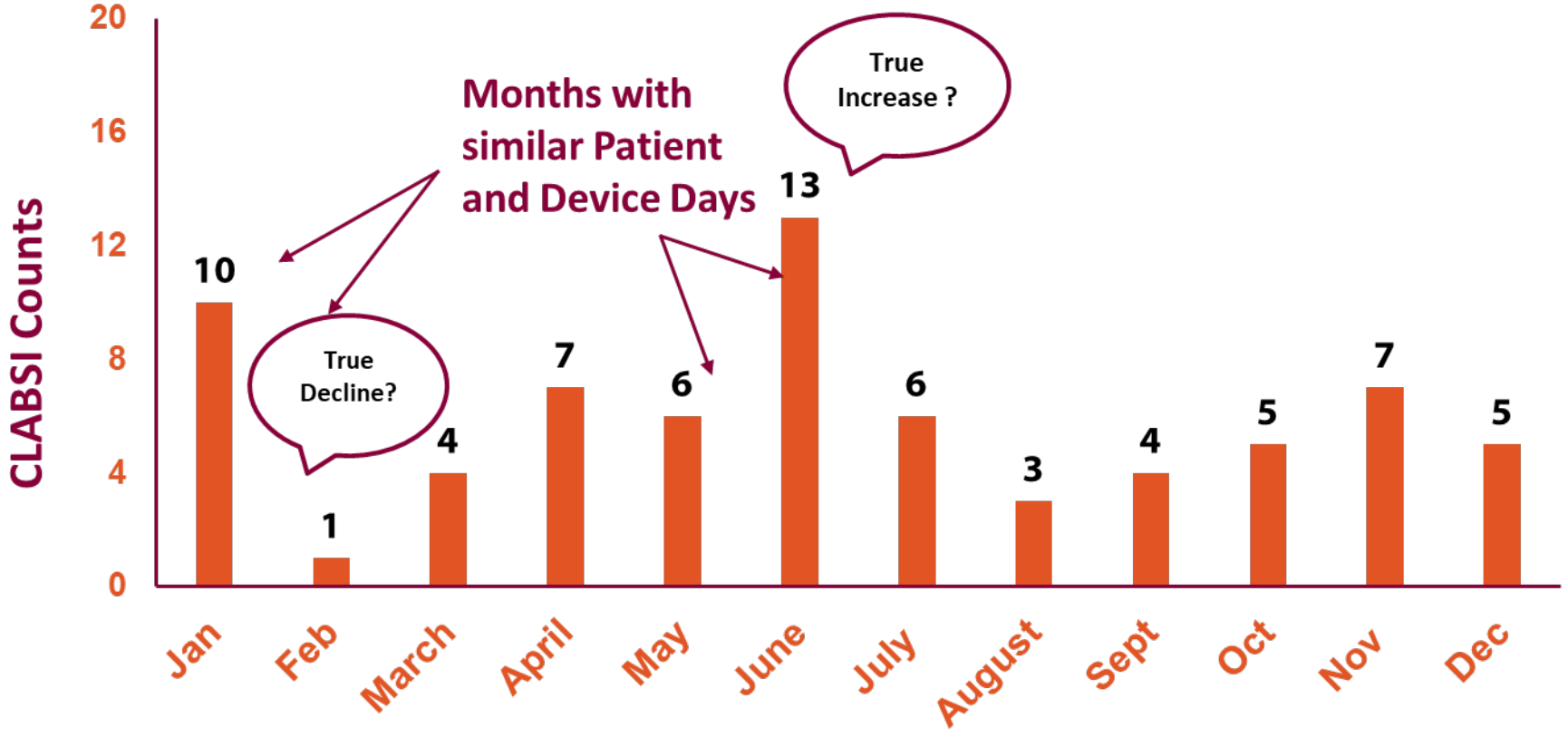
- Use Medical Record Abstraction Tools (MRATS) to identify accuracy of case-ascertainment from a list of candidate cases
- If candidate cases were ‘missed’ investigate why and how to fix it

Run Longitudinal Data Checks

Review longitudinal trends and assess errors

- Numerators by location and overall
- Denominators by location and overall
- SIRs by location and overall

Longitudinal Trends of CLABSI Events, LTAC Ward



How to Achieve Numerator Data Completeness

	Minimum Requirement
CLABSI	Review every positive blood specimen
CAUTI	Review every positive urine culture
SSI	• Identify and monitor all post -op patients and hospital readmissions related to infections • Review wound cultures, but realize culture -based surveillance missed 50-60% SSI • Daily hospital rounds to identify infections not resulting in cultures
LabID event FacWideIN	• Review all final lab test results (MRSA blood specimens, C. diff tests) • Assess labtests from ERand observation locations

How to Achieve Denominator Data Completeness

	Minimum Requirement
CLABSI/CAUTI	• Review presence of central line/ indwelling urinary catheter and complete collection of device days
SSI	• Review complete count of procedures based on ICD-10-PCS/CPTcodes
LabID event FacWideIN	• Review total patient admissions/encounters for every location (including ERand observation locations)

Confidence In Your Data

- Facilities held accountable for following NHSN methods
- Up-to-date with NHSN surveillance definitions and criteria
- Apply definitions with confidence every time

Summary

- Quality data is vital to HAI prevention
- In the era of “publicly looking good” ongoing internal data validation is the key to improvement in prevention practices
- Routine internal data validation will improve results in external data validation

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https://www.cdc.gov/nhsn/training/

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