Overview of the National Healthcare Safety Network for Long-term Care

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Presentation objectives

- Review the reporting options within the NHSN LTCF component
- Describe the characteristics of early nursing home reporters
- Discuss strategies for using NHSN data to guide infection prevention efforts
What is NHSN?

- CDC supported internet-based system designed for healthcare facility reporting of infections
- Data used by facilities for surveillance, benchmarking, and drive quality improvements
- Data used by CDC to establish national benchmarks and monitor success of efforts to prevent healthcare-associated infections (also called HAIs)
Why track infections in LTCF?

- To comply with infection surveillance regulations
- To identify the most common or most harmful infections impacting residents and staff
- To have a baseline to detect new or increasing infections (e.g., outbreaks)
- To have data to develop and evaluate infection prevention activities in the facility*

*Without data, we can’t show improvement
How does NHSN support LTCFs?

- Provides tools and resources to assist your surveillance program
- No fees for participation or the services related to reporting
- Data are secure, confidential and immediately available for analysis and use by the facility
- Facilities can choose to share data with others
  - Between partner facilities (e.g., multi-facility or corporate system) or with other entities (e.g., public health agencies or quality improvement organizations)
How can using NHSN benefit LTCFs?

- All reporting will use the same nationally accepted infection definitions
- Allows for fair comparison of rates by facility characteristics (e.g., # of beds or services provided)
- Provides national rates for facilities to use as a benchmark for assessing their own rates and prevention efforts
- Demonstrates trends in improvements in infection prevention by LTCFs across the country
NHSN Reporting Components

Patient Safety (PS)
- Used by hospitals and other acute care facilities for infection reporting

Healthcare Personnel Safety (HPS)
- Used by all healthcare facilities to report healthcare staff safety events (e.g., influenza vaccination)

Biovigilance (BV)
- Used by hospitals for reporting blood transfusion safety events

Long-term Care Facility (LTCF)
- Used by LTCFs for infection reporting

Dialysis
- Used by outpatient hemodialysis clinics

- LTCFs can enroll and report in the following:
  1. Long-term Care Facility Component

- For more information: www.cdc.nhsn/hps.html
NHSN Long-term Care Facility Component

- NHSN infection reporting tailored for LTCF providers, released in September 2012
- Offers standardized event criteria and data analysis across facilities
- Reporting options
  - Healthcare associated infections
  - Laboratory identified antibiotic resistant organisms and *C. difficile*
  - Prevention process measures

www.cdc.gov/nhsn/ltc
Targeted LTC Settings

Facilities eligible for enrolling in NHSN LTCF Component

- Certified skilled nursing facilities and nursing homes (SNF/NH)
- Intermediate/chronic care facilities for the developmentally disabled
- Assisted living facilities and residential care facilities
  - Currently limited to Prevention Process Measures
LTCF Component Reporting Modules

Healthcare-associated Infections (HAI)
- Urinary Tract Infections (UTI)

Laboratory-Identified (LabID) Event
- Multi-drug resistant organisms (MDRO)

Clostridium difficile infection (CDI)

Prevention Process Measures
- Hand Hygiene
- Gowns/Gloves
Modules & Events in the LTCF Component

- Healthcare-associated Infection Module
  - Urinary tract infection (UTI) events
    - Both catheter- and non catheter-associated

- Laboratory Identified (Lab-ID) Event Module
  - *C. difficile* infections (CDI)
  - Multidrug-resistance Organisms (MDRO)
    - Including: Methicillin-resistant *Staphylococcus aureus*, Vancomycin-resistant *Enterococcus*, Resistant *E. coli* and *Klebsiella*

- Preventions Process Measures Module
  - Hand hygiene adherence (observations)
  - Gown and glove use adherence (observations)
HAI Module: UTI reporting

- UTIs are frequently reported in nursing homes and drive antibiotic use among residents.
  - Focused monitoring of symptomatic UTIs, both catheter and non-catheter associated, informs infection prevention and antibiotic stewardship

- Event definitions based on the 2012 CDC/SHEA infection surveillance definitions, “Revised McGeer”
  - Events: Symptomatic UTI; Catheter-associated symptomatic UTI; Asymptomatic bacteremic UTI
UTI reporting (cont.)

- Symptomatic UTI requires documentation of clinical signs/symptoms (e.g., dysuria, suprapubic tenderness)
  - Initiation of antibiotic treatment is not a part of the surveillance definition
- Positive urine culture meeting minimum colony counts for at least one bacterial organism is also required
  - “Mixed flora” is not considered an organism and cannot be reported.
  - Yeast is not a qualifying organism for UTI surveillance
Laboratory identified event module

- Laboratory Identified (Lab-ID) MDRO/CDI events
  - Simplified surveillance approach which uses positive laboratory cultures used as a proxy for infection events
  - Reduces burden of data collection

- Events are categorized based on date of specimen collection compared with the following:
  - Date of resident’s current admission;
  - Date of recent hospital transfer (within previous 4 weeks)
  - Date of any previous positive specimen with same organism

- Standard Lab-ID event categories are applied across all healthcare settings reporting into NHSN
Lab-ID Event categories

- NHSN application automatically categorizes LabID events based on the following dates
- Current specimen collection date relative to the date of a prior LabID event
  - Incident event
  - Recurrent events
- Current specimen collection date relative to the date of current admission to facility
  - Community onset (CO) events
  - Long term care facility onset (LO) events
    - Acute care transfer long term care facility onset (ACT-LO)
A facility can choose to monitor one or more of the following organisms:

- **I. C. difficile infection (CDI)**
- **II. Multi-drug Resistant Organisms (MDROs)**
  - *Staphylococcus aureus*, methicillin-resistant (MRSA)
  - *Staphylococcus aureus*, methicillin-susceptible (MSSA)
  - Vancomycin-Resistant *Enterococcus* spp. (VRE)
  - Cephalosporin-Resistant *Klebsiella* spp. (CephR-Klebsiella)
  - Carbapenem-Resistant *Enterobacteriaceae* (CRE)
    - *Klebsiella* spp. (CRE-Klebsiella)
    - *E. coli.* (CRE-Ecoli)
    - *Enterobacter* (CRE-Enterobacter)
  - Multidrug-Resistant *Acinetobacter* spp. (MDR-Acinetobacter)
Examples of data analysis reports created by NHSN

- Line lists generated to catalogue events
  - Organized by type of event (e.g., catheter-associated)
  - Organized by specific MDRO or C. difficile LabID events

- Rate tables generated for each event type
  - Total UTI Rate/1,000 resident-days
    - Will have separate incidence rates for catheter and non-catheter associated events
  - Total CDI Rate/10,000 resident-days
  - Total MDRO Rate/1,000 resident-days

- Percent adherence to prevention process measures
  - Hand hygiene and Gown/glove use
How to get started using NHSN

- Obtain support from your organization’s leadership to participate in NHSN
  - Identify the “NHSN facility administrator” – the primary point of contact between your facility and NHSN

- Ensure computer/internet access for the NHSN facility administrator and any other users
  - Each person needs a current email address

- Review the enrollment training slides and materials on the NHSN LTCF website: [http://www.cdc.gov/nhsn/LTC/enroll.html](http://www.cdc.gov/nhsn/LTC/enroll.html)
Data for action requires more facilities to use NHSN

- Comparisons of infection data with adjustments for facility and/or resident characteristics
- National benchmarks to assess performance in local and national prevention efforts
- National trends in improvements and/or areas of opportunity for each infection event
Promoting NHSN for LTCFs

- April 2013: HHS Action Plan to Prevent HAIs in long-term care released
  - Increasing NHSN enrollment by nursing homes was 1st priority
  - Promoting CDI and UTI reporting in NHSN were other goals
- 2013-2015: State HAI programs start engaging nursing homes in NHSN use for MDRO/CDI prevention activities
  - Seven states actively recruiting nursing homes into NHSN as part of CDI/AR ELC-funding
  - Nevada was first state to mandate NHSN reporting by SNFs in Jan 2015
- June 2015: Position statement on HAI surveillance in LTCFs by Council of State and Territorial Epidemiologists
  - Identified NHSN as preferred option for HAI reporting
NHSN Enrolled Nursing Homes: 02/12/2013

61 facilities
14 states
NHSN Enrolled Nursing Homes: 06/4/2014

174 facilities
31 states
Drivers of NHSN use by nursing homes

- State HAI programs engaging nursing homes in NHSN use for MDRO/CDI prevention activities
- Hospital partners providing NHSN support for their affiliated healthcare partners
- Growing awareness of NHSN reporting incentives
  - CMS reporting programs in other post-acute care settings, (e.g., long-term acute care hospitals and inpatient rehab facilities)
  - Nevada become 1st state to require NHSN reporting for SNFs
  - Wisconsin surveyors starting to inquire about NHSN use during review of infection surveillance programs
NHSN LTCF Early enrollees: Jan 2013-Dec 2014

- Reviewed data reported from 201 facilities enrolled
- Median bed size was 109 (IQR 71-158)
- Median daily census was 99 (IQR 58-146)
- Median staff hours/week for infection control was 14 (IQR 8,24)
- 155 (77%) submitted at least one reporting plan

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<th>n (%)</th>
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<td>Medicaid/state only</td>
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<td><strong>Median staff hours per week dedicated to infection control (IQR)</strong></td>
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<td><strong>Facilities with ≥1 monthly reporting plan</strong></td>
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NHSN events and patterns of reporting: Jan 2013–Dec 2014

- CDI selected for reporting most often; UTI reporting completed most often
- 83% of facilities with a reporting plan submitted at least one complete month of data
- Consistent reporting (≥6 months of complete data) declined over time

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<th># of months completed</th>
<th>Percent completed</th>
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<tr>
<td>C. difficile</td>
<td>1358</td>
<td>1011</td>
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<td>Methicillin-resistant S. aureus</td>
<td>709</td>
<td>543</td>
<td>77%</td>
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<td>Urinary tract infection</td>
<td>673</td>
<td>547</td>
<td>81%</td>
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<tr>
<td>Vancomycin-resistant Enterococcus</td>
<td>581</td>
<td>451</td>
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<tr>
<td>Carbapenem-resistant E. coli</td>
<td>512</td>
<td>381</td>
<td>74%</td>
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<table>
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<th>Total number of facilities</th>
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<td>Intending to report &gt;1 event</td>
<td>110</td>
<td>118</td>
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<tr>
<td>&gt;1 completed month (% among intended)</td>
<td>92 (83.6)</td>
<td>97 (82.2)</td>
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<tr>
<td>Reported consistently* (% among completed)</td>
<td>70 (76.1)</td>
<td>46 (47.4)</td>
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<td>Median consecutive months of reporting (IQR)</td>
<td>6.5 (1, 8)</td>
<td>4 (1, 8)</td>
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Stone ND et al. ID Week 2015, Poster #321
Consistent Reporters, 2013 (N=70)

Consistent Reporters, 2014 (N=46)

Geography of NH Consistent Reporting: 2013 vs. 2014

Stone ND et al. ID Week 2015, Poster #321
Sustaining NHSN reporting by NHs

- Several barriers to voluntary reporting into NHSN
  - Staff turnover, limited time and resources, and competing priorities
  - Facilities using NHSN may not be getting maximum benefit from their data
- External partners/programs are a strong driver of NHSN use by LTCFs
  - Participation in collaboratives maintains engagement and accountability
  - Creates forum for sharing experiences and seeing how an individual facility’s experience compares to peers
National initiative to engage nursing homes in NHSN enrollment and reporting
CMS CDI reporting and reduction project, 2016-2019

- Working within the National NH Quality Care Collaborative
  - QIN-QIOs have already recruited ~7400 NHs into the collaborative
- CDI project goal to recruit 15% (~2300 NHs) to enroll in NHSN and sustain CDI reporting over the course of the project
- Participants will receive training and support on CDI reporting and prevention activities including:
  - NHSN enrollment, CDI event reporting and analysis
  - Training in LTC communication (TeamSTEPPS)
  - Education and resources to implement antibiotic stewardship
- Success in this effort will allow establishment of the first national baseline for *C. difficile* rates in nursing homes
Participating now...preparing for later

Expansion of NHSN reporting by nursing homes could eventually:

- Determine the scope/magnitude of HAI’s in LTC at a national level
- Establish national HAI incident rates to inform prevention and control policy
- Provide quality of care metrics for regulation/licensing
- Provide quality of care metrics for public reporting
CMS proposed regulations for infection prevention and control programs (IPC)

- Facility risk assessment of resident population
- Integrating IPC into QAPI activities
- Required review and update of IPC program, policies/procedures
- Antibiotic use protocols and monitoring
- Designated IPC Officer with specific training
- IPC-specific education and training for all staff
Improving Medicare Post-Acute Care Transformation:

- Compare quality across PAC settings;
- Align measures of quality and reporting among all post-acute care providers;
- Current CMS quality reporting programs for Long-term acute care hospitals and inpatient rehabilitation facilities include NHSN reporting.

**Timeline of Major Deliverables in the IMPACT Act of 2014**

- Use of Quality Data to Inform Discharge Planning
- Standardized Assessment Data for PAC and Other Providers Begins
- CMS Report on PAC Prospective Payment
- Standardized Quality and Resource Use Measure Reporting for PAC Providers Begins
- Study on Hospital Assessment Data
- MedPAC Report on PAC Prospective Payment

Prepared by House Ways and Means and Senate Finance Committee Staff March 18, 2014
NHSN is a national surveillance resource available to support infection prevention efforts in nursing homes.

Nursing home reporting into NHSN is growing:
- Consistent reporting is feasible with support and resources.
- Increasing opportunities for nursing homes to get involved.

Engage in activities now to prepare for the future:
- Facilities with strong surveillance and prevention programs may be viewed as leaders within healthcare communities.
- Your facility will have training and experience to meet any future regulatory or quality reporting expectations.

Take away points:
CDI REPORTING EXERCISE
CDI Lab-ID Event Form

- **Complete one form per CDI Event**
  - **Resident specific information:**
    - Date of birth
    - Gender
    - Short stay/long-stay
  - **Event specific information**
    - Date specimen collected
    - Site/source of specimen
    - Location at time of event
    - Resident admission dates and date of recent hospital transfers
NHSN Denominator Form

- Denominators are collected for an entire month
- CDI event monthly denominators include:
  - Total Resident-days
  - Total resident admissions
  - Number of residents admitted on *C. difficile* treatment
NHSN analysis outputs and reports

- Nursing home A has been entering CDI data into NHSN for 2015.
- What kinds of analysis outputs might be useful for reviewing their data?
- **NHSN Output options**
  - Line lists
  - Rate tables
    - Number of residents on CDI treatment at admission
    - Long-term care Facility incident CDI rates
LabID CDI Events Analysis

Long Term Care Facility Component
Analysis Output Options

MDRO/CDI Module - LABID Event Reporting
- All LabID Events
  - All MRSA LabID Events
  - All MSSA LabID Events
  - All C. difficile LabID Events
    - CDC Defined Output
    - Custom Output
  - All VRE LabID Events
  - All Ceph-R-Klebsiella LabID Events
  - All CRE LabID Events
  - All CRE-Klebsiella LabID Events
  - All CRE-Ecoli LabID Events
  - All CRE-Enterobacter LabID Events
  - All Acinetobacter LabID Events

CDC Defined Output
- Line Listing - All CDI LabID Events
- Rate Tables for CDI LabID Event Data
CDC-Defined Output

- **Line Lists**
  - Allows for record-level review of data
  - Helpful in pinpointing issues in data validity/quality
Line list

- Shows all the CDI events which have been submitted into the system
- Column 5 shows date of each event
- Column 8 shows the care location of each event
- Allows you to see clusters of infections which could indicate an outbreak

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Sorted by eventDate location
Data contained in this report were last generated on January 27, 2016 at 4:55 PM.
CDC-Defined Output

- **Rate tables**
  - Display a facility’s calculated rates
  - Helpful in pinpointing issues in data validity/quality
# Rate Tables

## Total CDI Rate

**Rate Tables for CDI LabID Event Data**

As of: January 26, 2016 at 4:37 PM  
Date Range: ALL LTCLABID_RATESCDF

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<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>2015M07</td>
<td>FACWIDEIN</td>
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<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>2015M08</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>2015M10</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>205</td>
<td>0</td>
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<tr>
<td>2015M11</td>
<td>FACWIDEIN</td>
<td>6</td>
<td>120</td>
<td>500</td>
</tr>
</tbody>
</table>

Source of aggregate data: Not available  
Data contained in this report was last generated on January 27, 2016 at 5:08 PM

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## National Healthcare Safety Network

**Rate Tables for CDI LabID Event Data**

**CDI Treatment Prevalence on Admission**

As of: January 26, 2016 at 4:37 PM  
Date Range: ALL LTCLABID_RATESCDF

<table>
<thead>
<tr>
<th>summaryYM</th>
<th>location</th>
<th>num Res Adm</th>
<th>CdfsRx</th>
<th>num Res Adm</th>
<th>cdITreatPrev</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015M01</td>
<td>FACWIDEIN</td>
<td>5</td>
<td>20</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>2015M02</td>
<td>FACWIDEIN</td>
<td>15</td>
<td>50</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2015M03</td>
<td>FACWIDEIN</td>
<td>20</td>
<td>20</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>2015M04</td>
<td>FACWIDEIN</td>
<td>33</td>
<td>50</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>2015M05</td>
<td>FACWIDEIN</td>
<td>65</td>
<td>500</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>
### CDI treatment Prevalence on Admission

**National Healthcare Safety Network Rate Tables for CDI LabID Event Data**

**CDI Treatment Prevalence on Admission**

As of: January 27, 2016 at 3:27 PM  
Date Range: All LTCLABID_RATE SC/CDIF

<table>
<thead>
<tr>
<th>orgID=39455</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>summaryYM</td>
<td>location</td>
<td>num Res Adm CdifRx</td>
<td>num Res Adm</td>
<td>cdiTreatPrev</td>
<td></td>
</tr>
<tr>
<td>2015M01</td>
<td>FACWIDEIN</td>
<td>5</td>
<td>20</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>2015M02</td>
<td>FACWIDEIN</td>
<td>15</td>
<td>50</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2015M03</td>
<td>FACWIDEIN</td>
<td>20</td>
<td>20</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>2015M04</td>
<td>FACWIDEIN</td>
<td>33</td>
<td>50</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>2015M05</td>
<td>FACWIDEIN</td>
<td>65</td>
<td>500</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>2015M06</td>
<td>FACWIDEIN</td>
<td>30</td>
<td>100</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2015M07</td>
<td>FACWIDEIN</td>
<td>150</td>
<td>450</td>
<td>33.333</td>
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</tr>
<tr>
<td>2015M08</td>
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<td>120</td>
<td>41.667</td>
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</tr>
<tr>
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<td>58</td>
<td>17.241</td>
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</tr>
<tr>
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<td>12</td>
<td>34</td>
<td>35.294</td>
<td></td>
</tr>
</tbody>
</table>

Source of aggregate data: Not available  
Data contained in this report were last generated on January 27, 2016 at 1:55 PM.

- **CDI Treatment Prevalence (column 5)** = \(\frac{\text{column 3}}{\text{column 4}}\) \times 100
- Each row represents a month of reporting
- Shows what percent of residents are being admitted each month already on treatment for CDI
The CDI treatment prevalence on admission reflects the proportion of new residents entering the facility on therapy for *C. difficile* infection.

Allows a nursing home to monitor whether the facility is admitting a population at higher risk for CDI.

May identify a cause for why trends in facility CDI rates are changing over time.
### LTCF-onset Incidence rate

LTCF-onset Incidence rate (column 5) = (column 3/ column 4) x 10,000

- Each row represents a month of reporting
- Shows the rate of CDI events which have onset in the nursing home over time

#### Table: LTCF-onset (LO) Incident CDI Rate

<table>
<thead>
<tr>
<th>summaryYM</th>
<th>location</th>
<th>ltcCDILOIncCount</th>
<th>numResDays</th>
<th>ltcLOCDIIncRate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015M01</td>
<td>FACWIDEIN</td>
<td>3</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>2015M02</td>
<td>FACWIDEIN</td>
<td>1</td>
<td>500</td>
<td>20</td>
</tr>
<tr>
<td>2015M03</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>350</td>
<td>0</td>
</tr>
<tr>
<td>2015M04</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>410</td>
<td>0</td>
</tr>
<tr>
<td>2015M05</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>1250</td>
<td>0</td>
</tr>
<tr>
<td>2015M06</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>2015M07</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>2015M08</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>2015M10</td>
<td>FACWIDEIN</td>
<td>0</td>
<td>205</td>
<td>0</td>
</tr>
<tr>
<td>2015M11</td>
<td>FACWIDEIN</td>
<td>3</td>
<td>120</td>
<td>250</td>
</tr>
</tbody>
</table>

Incident LO CDI LabID event counts include ACT-LO. Recurrent CDI events are excluded.

Source of aggregate data: Not available

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Reviewing the LTCF-onset incidence rate

- LTCF-onset (LO) incidence rate shows the rate of CDI events which have onset in the nursing home over time
  - Excludes recurrent CDI events
- Nursing homes should monitor trends in LTCF-onset CDI incidence rates for quality improvement purposes
  - Increasing rates may indicate a problem which needs further investigation
  - Decreasing rates may reflect the impact of prevention efforts
Interested in enrolling?

- There are several steps to enrolling a facility including:
  - Agreeing to the NHSN rules of behavior
  - Registering the facility and facility contact information with NHSN
  - Obtaining SAMS/NHSN access for all users
  - Submitting facility demographic information into the “NHSN Annual Facility Survey”
  - Signing and returning the NHSN consent form to CDC

- For step-by-step instructions about getting NHSN access for users and enrolling your facility, review the NHSN LTCF Enrollment slide set: http://www.cdc.gov/nhsn/LTC/enroll.html
CDC NHSN LTCF Component Training Resources

Thank you!!

Email: nstone@cdc.gov with questions/comments

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.