



Healthcare-associated Infections

2015 SIRs Using Historical Baselines

Introduction and Purpose

The Centers for Disease Control and Prevention's (CDC's) National Healthcare Safety Network (NHSN) developed and uses standardized infection ratios (SIRs) to measure healthcare-associated infection (HAI) incidence. Each SIR is a summary statistic that compares the number of observed HAIs in a facility, state, or nation, to the number of predicted HAIs based on a national baseline. When the SIR is less than one, fewer infections were observed than predicted indicating progress in HAI prevention. Since 2009, CDC has calculated SIRs for select HAI types using historical national baselines, which varied by infection and facility type.¹ The historical baselines remained constant for several years, allowing CDC and other organizations to measure progress and assess changes in HAI incidence from a single starting point in time. State and national SIRs have been published annually by CDC in the National and State HAI Progress Report², which summarizes the progress in HAI prevention compared to the historical national baselines, and compared national and state SIRs to those from the prior year.

CDC performs regular reviews of the HAI definitions used in NHSN and works to improve these definitions based on new scientific evidence and user feedback. Recently, NHSN user concerns about the objectivity and specificity of some HAI definitions prompted CDC to introduce modified versions of those definitions, most notably in 2015. Because of these major changes, the HAI predictive models used to calculate the predicted number of infections in the SIR denominators needed to be updated using HAI data reported to NHSN in accordance with the recently modified HAI definitions. CDC opted to develop new SIR baselines using the 2015 HAI data that healthcare facilities reported to NHSN because by then all recent HAI definitional changes were in use.¹ An important result is the new baselines, established using 2015 HAI data, reflect more recent national HAI experience and prevention efforts than the initial set of baselines. However, another important result is that direct comparisons of SIRs calculated using the old and new baselines—in effect, comparisons of HAI summary statistics in which different sets of HAI definitions and predictive models are used—are less readily interpretable than comparisons of SIRs using the same baseline. The result is that the 2015 HAI data reported by CDC as SIRs marks the start of a new reporting period, during which CDC and other organizations can measure HAIs at the facility, state, and national levels compared to the 2015 national HAI experience. Eventually, CDC will need to update the new baselines—periodic rebaselining is an inherent requirement of a comparative statistic in which data from a prior time period provides the basis for the comparison—but CDC's goal is to defer each update for as long as possible and replace baselines only when the need for replacement is imperative.

CDC's 2015 National and State HAI Data Report will provide 2015 SIRs calculated using the 2015 national baseline and risk adjustment. This report will provide national and state-specific snapshots of HAIs in 2015, compared to the national 2015 baseline. The 2015 HAI Data Report will be the first to measure HAIs with the 2015 baseline; therefore, the results in this report cannot be compared to SIRs from earlier years. CDC recognizes the importance of continuously monitoring HAIs over time in order to assess progress, identify opportunities for prevention, and provide actionable data each year. To that end, this paper will offer a 2015 national snapshot of select HAIs in acute care and critical access hospitals using SIRs calculated with the historical national baselines and risk adjustment methods such that comparisons can be made between 2015 and 2014. However, due to the numerous protocol and HAI definition changes made since the historical baseline time periods, caution should be used when interpreting 2015 SIRs calculated with the historical baselines, as these SIRs may reflect (to some extent) changes in reporting protocols rather than a true reflection of changes in HAI incidence. For these reasons, CDC discourages regional or facility-level comparisons between 2015 and 2014 SIRs, and would recommend caution when drawing any conclusions about national progress in 2015 using SIRs calculated with the historical baseline. Details of major protocol changes and their potential impact on the 2015 SIRs are described below by HAI type.

This paper provides a summary of the 2015 national SIRs using the historical baselines for select HAI types. The data and methods used in this analysis are consistent with those published by CDC in the previous National and State HAI Progress Report.² National SIRs in this analysis may differ from those presented on the Centers for Medicare and Medicaid

Services’ (CMS) Hospital Compare website due to differences in reporting facilities and patient care locations, reporting deadlines, and/or risk adjustment methodology. These analyses used data reported to NHSN no less than six months following the end of each calendar year.

Executive Data Summary

National 2015 SIRs Calculated Under Historical Baselines*

HAI Type	# Hospitals	# Reported Infections	# Predicted Infections	2015 SIR	Percent Change (%) from 2014‡
Catheter-associated Urinary Tract Infection (CAUTI)	4,165	27,029	47,497.17	0.569+	43.0% decrease
Central Line-associated Bloodstream Infection (CLABSI)	3,935	27,313	45,279.51	0.603+	21.8% increase
Surgical Site Infection (SSI)- Abdominal Hysterectomy	3,248	2,091	2,479.48	0.843+	no significant change
Surgical Site Infection (SSI) – Colon Surgery	3,395	9,280	9,201.82	1.008	3.3% increase
MRSA Bacteremia LabID Event	4,035	8,898	9,329.72	0.954+	9.9% increase
C.difficile LabID Event	4,127	101,610	109,862.78	0.925+	no significant change

Footnotes

* Historical baseline years: CLABSI and SSI- 2006-2008. CAUTI- 2009. MRSA Bacteremia and C.difficile LabID: 2010-2011
+ SIR is significantly different from 1.
‡ Several protocol changes in NHSN may have contributed to the observed differences between the 2014 and 2015 national SIRs. See discussion below for further details.

Catheter-Associated Urinary Tract Infections (CAUTI) in 2015 Compared to the 2009 Baseline

Note: The SIRs below are inclusive of CAUTI data from all reporting inpatient locations eligible for inclusion in the SIR. Under the 2009 baseline, the CAUTI SIR is risk-adjusted for patient care location and, in some cases, medical school affiliation and location bed size, using stratified pooled mean rates.³

CAUTI Results

The 2015 national CAUTI SIR, calculated using the 2009 national baseline, is **0.569**:

- Corresponds to 43% significant decrease in the national CAUTI SIR compared to 2009.
- Between 2014 and 2015, the national CAUTI SIR decreased by 43% (p<0.0001)

National CAUTI SIR for Acute Care and Critical Access Hospitals, 2014 vs. 2015

Year	# Hospital	# Reported CAUTI	# Predicted CAUTI	SIR	95% Confidence Interval
2014	3,791	35,760	35,761.590	1.000	(0.990, 1.010)

Year	# Hospital	# Reported CAUTI	# Predicted CAUTI	SIR	95% Confidence Interval
2015	4,165	27,029	47,497.170	0.569	(0.562, 0.576)

National Urinary Catheter Utilization, 2014 vs. 2015

Year	Urinary Catheter Days	Patient Days	Device Utilization Ratio (DUR)
2014	19,152,086	69,005,504	0.28
2015	25,878,561	112,471,353	0.23

Frequent Pathogens Reported to NHSN Among 2014 and 2015 CAUTIs

Pathogen	2014 CAUTI			2015 CAUTI		
	# Pathogens	% Pathogens	Rank	# Pathogens	% Pathogens	Rank
<i>Escherichia coli</i>	9,409	23.4	1	10,412	34.2	1
<i>Candida albicans</i> *	5,523	13.7	2	5	<0.1	16
<i>Klebsiella pneumoniae/oxytoca</i>	3,784	9.4	3	4,208	13.8	2
<i>Pseudomonas aeruginosa</i>	3,443	8.6	4	3,820	12.5	3
Yeast not otherwise specified*	3,051	7.6	5	7	<0.1	14
<i>Enterococcus faecalis</i>	2,780	6.9	6	2,886	9.5	4
Other <i>Candida</i> spp.*	1,652	4.1	7	6	<0.1	15
Other <i>Enterococcus</i> spp.	1,550	3.8	8	1,351	4.4	7
<i>Proteus</i> spp.	1,396	3.5	9	1,615	5.3	5
<i>Enterobacter</i> spp.	1,376	3.4	10	1,516	5.0	6
<i>Candida glabrata</i> *	1,218	3.0	11	2	<0.1	17
Coagulase-negative staphylococci	1,076	2.7	12	899	2.9	8
<i>Enterococcus faecium</i>	847	2.1	13	790	2.6	9
<i>Staphylococcus aureus</i>	700	1.7	14	681	2.2	10
<i>Serratia</i> spp.	297	0.7	15	280	0.9	11
<i>Acinetobacter</i> spp.	176	0.4	16	171	0.6	12
Viridans streptococci	76	0.2	17	83	0.3	13
Other pathogens	1,915	4.8		1,748	5.7	

	2014 CAUTI			2015 CAUTI		
Pathogen	# Pathogens	% Pathogens	Rank	# Pathogens	% Pathogens	Rank
Total	40,269	100.0		30,480	100.0	

*Note: All yeast species combined represent 11,444 (28.4%) of 2014 CAUTI pathogens. 2015 CAUTIs in which a yeast species was reported (20 pathogens, <0.1%) also had a bacterial pathogen isolated from the culture.

CAUTI Discussion

In 2015, CMS expanded their requirements for participation in the Hospital Inpatient Quality Reporting (HIQR) Program to include the reporting of CLABSI and CAUTI data to NHSN from adult and pediatric medical, surgical, and medical/surgical wards. Previously, CAUTI data were only required to be reported from adult and pediatric intensive care units (ICUs).⁴ The expanded reporting requirements resulted in facilities without any ICUs to begin reporting CAUTI data to NHSN in 2015, and thus contributed to the modest increase in the number of reporting facilities between these two years.

While the 2015 CAUTI SIR appears to show a 43% significant decline compared to 2014, much of this decrease is a surveillance artifact resulting from HAI definition changes. The NHSN definition for CAUTI was updated in 2015 to exclude the following urine cultures: ⁵

- Cultures in which all organisms were non-bacterial
- Symptomatic UTIs (SUTIs) in which colony counts of less than 100,000 CFU/ml were used to meet the CAUTI definition

These definition changes were made in response to ongoing concerns expressed by NHSN users, particularly with regard to urine cultures that are positive for yeast which typically represent colonization rather than true infection.^{6,7} Prior to 2015, yeasts were a common cause of reported CAUTIs to NHSN; in 2014, yeasts accounted for 28.4% of CAUTIs. After the definition changes, 8,731 fewer UTIs were reported to NHSN as a CAUTI.

To make a better comparison of CAUTI data between 2014 and 2015, the 2014 CAUTI national SIR was recalculated with non-bacterial organisms removed. When non-bacterial CAUTIs were excluded from the CAUTI SIRs, a 17.1% relative decline in the national SIR was observed in 2015 compared to 2014. This decline likely reflects both a real national decline in CAUTIs as well as removal of the proportion of all CAUTIs caused by colony counts of less than 100,000 CFU/ml between 2014 and 2015.

The unadjusted urinary catheter device utilization ratio (DUR) provides a national estimate of device use across all patient care locations reported to NHSN. A decline in urinary catheter utilization was observed between 2014 and 2015; catheter utilization dropped from 28% of patient days in 2014 to 23% of patient days in 2015. This is consistent with the 2015 expansion of the HIQR Program to include CAUTI reporting from select ward locations, which generally have lower urinary catheter use. Additional national reports for 2015 data and forward will include a standardized utilization ratio (SUR) which adjusts for patient care location and facility-level factors.

Central Line-Associated Bloodstream Infections (CLABSI) in 2015 Compared to the 2006-2008 Baseline

Note: The SIRs below are inclusive of CLABSI data from all reporting inpatient locations eligible for inclusion in the SIR. Under the 2006-2008 baseline, the CLABSI SIR is risk-adjusted for patient care location and, in some cases, medical school affiliation and location bed size, using stratified pooled mean rates.⁸

CLABSI Results

The 2015 national CLABSI SIR, calculated using the 2006-2008 national baseline, is **0.603**:

- Corresponds to 40% significant decrease in the national CLABSI SIR compared to 2006-2008
- Between 2014 and 2015, the national CLABSI SIR increased by 21.8% (p<0.0001)

National CLABSI SIR for Acute Care and Critical Access Hospitals, 2014 vs. 2015

Year	# Hospital	# Reported CLABSI	# Predicted CLABSI	SIR	95% Confidence Interval
2014	3,655	17,758	35,872.961	0.495	(0.488, 0.502)
2015	3,935	27,313	45,279.510	0.603	(0.596, 0.610)

National central line utilization comparing 2014 and 2015 data

Year	Central Line Days	Patient Days	Device Utilization Ratio (DUR)
2014	19,194,345	76,332,099	0.25
2015	25,158,759	109,868,272	0.23

Frequent Pathogens Reported to NHSN Among 2014 and 2015 CLABSI

Pathogen	2014 CLABSI			2015 CLABSI		
	# Pathogens	% Pathogens	Rank	# Pathogens	% Pathogens	Rank
Coagulase-negative staphylococci	3,380	15.4	1	4,305	12.9	1
<i>Staphylococcus aureus</i>	2,863	13.0	2	4,144	12.4	2
<i>Klebsiella pneumoniae/oxytoca</i>	1,849	8.4	3	2,922	8.7	3
<i>Enterococcus faecalis</i>	1,547	7.0	4	2,498	7.5	4
<i>Escherichia coli</i>	1,493	6.8	5	2,496	7.5	5
<i>Enterococcus faecium</i>	1,477	6.7	6	1,986	5.9	7
<i>Candida albicans</i>	1,305	5.9	7	2,267	6.8	6
Other <i>Candida</i> spp.	1,104	5.0	8	1,754	5.2	8
<i>Enterobacter</i> spp.	945	4.3	9	1,467	4.4	9
<i>Pseudomonas aeruginosa</i>	865	3.9	10	1,329	4.0	10
<i>Candida glabrata</i>	704	3.2	11	1,216	3.6	11
Viridans streptococci	519	2.4	12	785	2.3	12
<i>Serratia</i> spp.	416	1.9	13	608	1.8	13
<i>Acinetobacter</i> spp.	401	1.8	14	548	1.6	15
Other <i>Enterococcus</i> spp.	345	1.6	15	583	1.7	14
Yeast not otherwise specified	181	0.8	16	310	0.9	17

	2014 CLABSI			2015 CLABSI		
Pathogen	# Pathogens	% Pathogens	Rank	# Pathogens	% Pathogens	Rank
<i>Proteus</i> spp.	168	0.8	17	268	0.8	18
Other pathogen	2,452	11.1		3,924	11.8	
Total	22,014	100.0		33,410	100.0	

Note: All yeast species combined represent 3,294 (15.0%) of 2014 CLABSI pathogens and 5,547 (16.6%) of 2015 CLABSI pathogens.

CLABSI Discussion

As mentioned above, CMS expanded their requirements for participation in the HIQR Program to include the reporting of CLABSI and CAUTI data to NHSN from adult and pediatric medical, surgical, and medical/surgical wards. Previously, CLABSI data were only required to be reported from adult, pediatric, and neonatal intensive care units (ICUs).⁴ The expanded CLABSI reporting requirements resulted in facilities without any ICUs to begin reporting CLABSI data to NHSN. This contributed to the modest increase in number of facilities reporting CLABSI data from 3,655 in 2014 to 3,935 in 2015.

The increase in the 2015 CLABSI SIR compared to the previous year was observed across all location types (ICUs, NICUs, and Wards) reporting to NHSN, and is largely due to HAI surveillance protocol changes in 2015.⁵ These changes increased the objectivity of HAI surveillance by quantifying timeframes during which all criteria must be met, and reduced the commonly perceived opportunities for misclassification of bloodstream infections (BSIs) as secondary to another site of infection and therefore excluded from CLABSI data. Furthermore, the NHSN definition of catheter-associated urinary tract infection (CAUTI) was modified in 2015 to exclude any urine cultures that were positive for only non-bacterial pathogens. Prior to 2015, some BSIs with only non-bacterial organism(s) could have been classified as secondary to CAUTI, and therefore not reported as a primary CLABSI to NHSN. Starting in 2015, non-bacterial UTIs no longer met the CAUTI definition, causing non-bacterial positive blood cultures to be considered for the primary BSI definition. The percentage of CLABSIs reported to NHSN with at least one yeast pathogen increased 11% between 2014 and 2015, which may be a reflection of the above protocol changes.

The protocol changes described above contributed to an increase in the number of CLABSIs reported to NHSN and thus, an increase in the 2015 CLABSI SIR. The unadjusted central line device utilization ratio (DUR) provides a national estimate of central line use; in 2015, the national DUR was 0.23 (i.e., 23% of patient days had a central line in place), which is a significant decrease compared to the central line DUR in 2014 (25%). The decrease in device utilization may be due to increased reporting from non-ICU locations, where central line use is less common. Additional national reports for 2015 data and forward will include a standardized utilization ratio (SUR) which adjusts for patient care location and facility-level factors.

Surgical Site Infections (SSI) in 2015 Compared to the 2006-2008 Baseline

*Note: The SIRs below are calculated for abdominal hysterectomy and colon procedures, the two procedure categories required for participation in the CMS HIQR Program. SIRs are calculated using CDC’s Complex Admission/Readmission Model, which includes SSIs classified as deep incisional or organ/space infections following inpatient procedures with a primary skin closure technique, detected during the same admission as the procedure or upon readmission to the same facility.*⁹

A. SSI – Abdominal Hysterectomy (HYST) Results & Discussion:

The 2015 national HYST SIR, calculated using the 2006-2008 national baseline, is **0.843**:

- Corresponds to 16% significant decrease in the national HYST SIR compared to 2006-2008
- Between 2014 and 2015, the national HYST SIR did not change significantly (p=0.4886)

National HYST SSI SIR for Acute Care Hospitals, 2014 vs. 2015

Year	# Hospitals	# Reported HYST SSIs	# Predicted HYST SSIs	Total # HYST Procedures	SIR	95% Confidence Interval
2014	3,225	2,020	2,447.611	307,648	0.825	(0.790, 0.862)
2015	3,248	2,091	2,479.480	307,534	0.843	(0.808, 0.880)

The SSI HYST SIR increased in 2015 compared to 2014, however this increase is not statistically significant. While changes have been made to the NHSN SSI surveillance protocols since the 2006-2008 baseline time period, these changes had minimal impact on the HYST SIRs. The number of reporting hospitals and the total number of reported procedures did not drastically change between 2014 and 2015.

B. SSI – Colon Surgery (COLO) Results & Discussion

The 2015 national COLO SIR, calculated using the 2006-2008 national baseline, is **1.008**:

- Corresponds to < 1 % increase in the national Colon Surgery SIR compared to 2006-2008. This increase is not statistically significant.
- Between 2014 and 2015, the national Colon Surgery SIR increased by 3.3% (p=0.0270)

National Colon Surgery SSI SIR for Acute Care Hospitals, 2014 vs. 2015

Year	# Hospitals	# Reported COLO SSIs	# Predicted COLO SSIs	Total # COLO Procedures	SIR	95% Confidence Interval
2014	3,377	8,952	9,172.197	300,526	0.976	(0.956, 0.996)
2015	3,395	9,280	9,201.820	303,342	1.008	(0.988, 1.029)

Numerous SSI surveillance protocol changes have been made in NHSN since the 2006-2008 baseline that make it difficult to draw conclusions from the 2015 COLO SSI SIR using this baseline. In 2013, a revised definition of primary closure was introduced that likely caused additional procedures and SSIs to be reported to NHSN; the change in definition broadened the term “primary closure” to include incisions described as “loosely closed” at the skin level. In addition, a change was introduced to the NHSN rule for attributing a SSI to a specific operative procedure category in the event that multiple procedures were performed through the same incision. Specifically, colon surgeries were moved from the 5th to 2nd priority position. Both protocol changes likely added to the number of SSIs that were attributed to colon surgeries.

The COLO SSI SIR significantly increased in 2015 compared to 2014. There was an increase in the number of reported SSIs in 2015, resulting in a higher SIR in 2015 compared to 2014. Protocol clarifications and data entry forms were modified in 2015 to reinforce the requirement that SSIs identified as present at time of surgery (PATOS) must be reported to NHSN.⁵ In years prior to 2015, reporting of such events was required per the protocol but this requirement was not indicated in the reporting form, therefore facilities may have been underreporting SSI events to NHSN in which the SSI was identified prior to or at the time of surgery. While there was a slight increase in the number of reporting hospitals and total colon procedures in 2015, the SIR denominator is designed to account for this. However, because the SIR numerator increased in greater magnitude than the SIR denominator, the overall SIR in 2015 increased by 3.3% compared to the prior year.

MRSA Bacteremia Laboratory-identified Events in 2015 Compared to the 2010-2011 Baseline

*Note: The MRSA Bacteremia SIRs represent data reported from all inpatient units in the facility (FacWideIN). Under the 2010-2011 baseline, the MRSA Bacteremia SIR is risk adjusted for facility bed size, inpatient community-onset prevalence rate, and medical school affiliation.*¹⁰

MRSA Bacteremia Results

The 2015 national SIR for MRSA bacteremia, calculated using the 2010-2011 national baseline, is **0.954**:

- Corresponds to 5% significant decrease in the national MRSA bacteremia SIR compared to 2010-2011
- Between 2014 and 2015, the national MSRA bacteremia SIR increased by 9.9% (p<0.0001)

National MRSA Bacteremia SIR Data for Acute Care and Critical Access Hospitals, 2014 vs. 2015

Year	# Hospitals	# Reported Healthcare-onset MRSA Bacteremia	# Predicted Healthcare-onset MRSA Bacteremia	Total Patient Days	SIR	95% Confidence Interval
2014	3,949	9,230	10,636.257	161,416,374	0.868	(0.850, 0.886)
2015	4,035	8,898	9,329.721	155,583,987	0.954	(0.934, 0.974)

National Inpatient Community-onset (CO) MRSA Bacteremia Prevalence Rate, 2014 vs. 2015

Year	# Reported Inpatient CO MRSA Bacteremia	Total Admissions	Inpatient CO MRSA Bacteremia Prevalence Rate per 100 admissions
2014	42,159	36,234,912	0.116
2015	27,679	35,640,354	0.078

MRSA Bacteremia Discussion

The 2015 MRSA bacteremia SIR reveals a significant decrease in the incidence of healthcare-onset MRSA bacteremia compared to the 2010-2011 baseline. However, an increase is observed in the 2015 national SIR compared to the prior year. This increase can be attributed to substantial protocol changes to NHSN’s LabID Event Reporting protocols that were introduced in 2015 to improve objectivity and enhance identification of healthcare-onset LabID events.⁵

Overall, fewer inpatient MRSA bacteremia events were predicted in 2015 compared to 2014. This can be explained by the sudden decrease in the 2015 inpatient community-onset (CO) prevalence rate, which is an important factor in the calculation of the number of predicted events. In 2015, NHSN protocol required that facilities performing facility-wide inpatient (FacWideIN) surveillance must also perform surveillance of the same organism in all emergency departments (EDs) and 24-hour observation units. Prior to this, reporting of LabID events from EDs and observation units occurred only when the patient was admitted to the hospital on the same calendar day as the specimen collection date. Though inpatient CO cases remain defined by occurrence during the first 3 calendar days after admission (with calendar day 1 defined as the date of admission), NHSN uses a 14-day window to identify “duplicate” MRSA bacteremia specimens. This means that any positive inpatient specimen collected within 14 days after a prior positive specimen will be excluded from the inpatient CO prevalence rate. Beginning in 2015, this 14-day duplicate window for a given patient included any MRSA bacteremia specimens collected in an ED or 24-hour observation. This caused *fewer* events to be counted in the inpatient CO prevalence rate in 2015 compared to 2014 (i.e., more inpatient CO events were considered “duplicates” due to a prior positive from the ED). Due to the risk adjustment calculations for the MRSA bacteremia SIR, a decrease in the inpatient CO prevalence rate led to a decrease in the number of predicted healthcare-onset MRSA bacteremia events (SIR denominator), thus causing an increase in the SIR in 2015 compared to 2014.

Compared to 2014, hospitals reported 3.6% fewer healthcare-onset MRSA bacteremia events and 3.6% fewer patient days in 2015, while the number of predicted healthcare-onset events decreased by 12.3%. This greater magnitude of decrease in the number of predicted events resulted in an increase in the national SIR in 2015. A 2015 protocol change resulted in

the exclusion of LabID events, admissions, and patient day counts from CMS-certified inpatient rehabilitation units (IRFs) and inpatient psychiatric units (IPFs), which may have contributed to some of the reduction in total patient days and healthcare-onset MRSA bacteremia events in 2015.

The updated MRSA bacteremia risk adjustment model for acute care hospitals derived from the 2015 baseline data includes an outpatient MRSA prevalence rate from EDs and 24 hour observation units. This, in addition to the inpatient CO prevalence rate, will allow for a comprehensive adjustment of a facility's SIR for the prevalence of MRSA in the surrounding community.

Clostridium difficile Laboratory-identified Events (CDI) in 2015 Compared to the 2010-2011 Baseline

Note: The CDI SIRs include data from all inpatient units in the facility, with the exception of neonatal intensive care units (NICUs) and well-baby nursery units. Under the 2010-2011 baseline, the CDI SIR is risk adjusted for CDI test type, facility bed size, inpatient community-onset prevalence rate, and medical school affiliation.¹⁰

CDI Results

The 2015 national SIR for CDI, calculated using the 2010-2011 national baseline, is **0.925**:

- Corresponds to a 7% significant decrease in the national CDI SIR compared to 2010-2011
- Between 2014 and 2015, the national CDI SIR did not change significantly (p=0.7416)

National CDI SIR Data for Acute Care and Critical Access Hospitals, Facility-wide, 2014 vs. 2015

Year	# Hospitals	# Reported Healthcare-onset CDI	# Predicted Healthcare-onset CDI	Total Patient Days	SIR	95% Confidence Interval
2014	3,994	101,074	109,443.460	147,984,317	0.924	(0.918, 0.929)
2015	4,127	101,610	109,862.775	143,188,203	0.925	(0.919, 0.931)

National Inpatient Community-onset (CO) CDI Prevalence Rate, 2014 vs. 2015

Year	# Reported Inpatient CO CDI events	Total Admissions	Inpatient CO CDI Prevalence Rate per 100 admissions
2014	121,788	32,725,259	0.372
2015	119,906	32,447,537	0.370

CDI Discussion

The 2015 CDI SIR reveals a significant decrease in the incidence of healthcare-onset CDI compared to the 2010-2011 baseline. However, the CDI SIR did not significantly change between 2014 and 2015. While the same protocol changes explained above for MRSA bacteremia (i.e., requiring surveillance of LabID events in emergency departments and 24 hour observation locations, exclusion of events and denominators from IRF and IPF units) were also applied to CDI surveillance in 2015, there was minimal impact on the inpatient CO CDI prevalence rate. In order to fully capture the burden of all CDI cases entering inpatient units within the facility, this inpatient prevalence rate captures all CO events in which the specimen was collected within 3 days of patient admission, including those events that are categorized as “Recurrent” or those that are subsequent to a prior positive specimen collected in an outpatient location. As only a small fraction (< 1%)

of inpatient CO CDI events were identified following a previous outpatient specimen, the protocol changes in 2015 had minimal impact to the inpatient CO CDI prevalence rate and number of predicted CDI events. This, in conjunction with minimal changes to the number of reported healthcare-onset CDI, led to a stable SIR between the two years.

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