Eliminating CLABSI A National Patient Safety Imperative

Second Progress Report on the National *On the CUSP: Stop BSI Project*

A Project of:

Health Research & Educational Trust
Johns Hopkins University Quality and Safety Research Group
Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality

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Background

Healthcare-associated infections (HAIs) are infections that people acquire while they are receiving treatment for another condition in a health care setting. They are costly, deadly, and largely preventable. The U.S. Department of Health and Human Services' Action Plan to Prevent Healthcare-Associated Infections is focusing attention on the need to dramatically reduce these infections; a recent CDC Report suggests that considerable progress is being made towards this goal. As part of this initiative, the Agency for Healthcare Research and Quality (AHRQ) is funding a national effort to prevent central line-associated bloodstream infections (CLABSIs) in U.S. hospitals. The *On the CUSP: Stop BSI* project is led by a unique partnership. This partnership consists of the Health Research & Educational Trust, the nonprofit research and educational affiliate of the American Hospital Association; the Johns Hopkins University Quality and Safety Research Group, which developed an innovative approach for improving patient safety; and the Michigan Health & Hospital Association's Keystone Center for Patient Safety & Quality, which used this approach to dramatically reduce CLABSIs in Michigan. This report summarizes progress made in the first 2 years of the *On the CUSP: Stop BSI* project.

Participation

On the CUSP: Stop BSI requires that participating States have a lead organization that works with hospitals across their State to implement the clinical and cultural changes needed to reduce CLABSIs. Thus far, 46 hospital associations and one umbrella group have committed to leading the project in their States. Collectively, these groups have recruited more than 1,055 hospitals and 1,775 hospital teams to participate in the project. Twenty-two States began the project in 2009, 14 States and the District of Columbia began during 2010, and 9 States and Puerto Rico began the effort in 2011.

Project Impact

- We examined the impact of the project on patients from units/teams in cohorts 1–4 that began participating in the project in 2009 and 2010. Compared to a baseline CLABSI rate of 1.87 infections per 1,000 central line days in these units, after 10–12 months of participation in the project, CLABSI rates in these cohorts have decreased to 1.25 infections per 1,000 central line days, a relative reduction of 33 percent.

- The percentage of units with zero quarterly CLABSIs increased from 27.3 percent at baseline to 69.5 percent for cohorts 1 through 4 at the end of period 4.

- For improvement in safety culture, there was little change in team members' responses to questions about the safety culture on their units between the baseline and followup surveys.

Conclusions

Progress toward achieving the project's stated goals is encouraging, but substantial work remains. Key conclusions thus far include:

- Hospital adult ICUs included in this report are drawn from 32 states and territories, and more than 750 hospitals. This is an increase of 10 states and 400 hospitals since November 2010. These units have reduced their CLABSI rates by an average of 33 percent. As of November 2010, CLABSI rates had decreased by an average of 35 percent indicating rates are continuing to decrease but at a marginally slower rate.
- At baseline, many of these units had CLABSI rates below the national mean and were still able to reduce their rates.
- The project demonstrates that even among hospitals that have already achieved low CLABSI rates, further improvement is possible and achievable.

INTRODUCTION AND OBJECTIVE

Healthcare-associated infections (HAIs) are largely preventable, and their occurrence can be dramatically reduced, to save lives and excess costs. The Department of Health and Human Services (HHS) launched an Action Plan to Prevent Healthcare-Associated Infections to improve patient safety and health care quality by providing a roadmap for preventing HAIs. HHS also launched the Partnership for Patients initiative aimed at keeping patients from getting injured or sicker in the health care system and helping patients heal without complication by improving transitions from acute-care hospitals to other care settings. A recent CDC report suggests that considerable progress is being made in preventing central line associated blood stream infections, but that further improvement is still needed.[1] To further the effort to prevent HAIs, two large-scale initiatives have been funded and launched by the Agency for Healthcare Research and Quality (AHRQ). The goal of these initiatives is to prevent both central line-associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI). Both initiatives use a combination of evidence-based best practices to reduce the risk of infections and the Comprehensive Unit-Based Safety Program (CUSP) to improve the culture of patient safety. Researchers at the Johns Hopkins University Quality and Safety Research Group (QSRG) initially developed CUSP. CUSP was subsequently implemented in collaboration with the Michigan Health & Hospital Association's Keystone Center for Patient Safety & Quality (MHA Keystone Center) and hospitals across Michigan. This implementation resulted in a dramatic and sustained decrease in CLABSI rates in that State.[2]

AHRQ has awarded contracts totaling $18 million to the Health Research & Educational Trust (HRET), the nonprofit research and educational affiliate of the American Hospital Association (AHA), to lead the national initiative to reduce CLABSI rates. HRET is partnering with the QSRG at Johns Hopkins University and the MHA Keystone Center to lead this effort. A recent expansion of HRET's contract now provides limited resources to the State hospital associations and other organizations leading this effort at the State level. Prior to this, these organizations funded their support of this project with their own resources or funds from other sources. The national *On the CUSP: Stop BSI* project represents the first federally funded national effort with a clearly stated outcome goal: the reduction of CLABSI rates to less than 1 per 1,000 central line days across all U.S. hospitals participating in the project. If this goal is achieved, the project will substantially reduce deaths and unnecessary costs associated with CLABSIs.

Since the project's inception in October 2008, lead organizations (primarily State hospital associations) have been recruited in 44 States. As of November 2010, 38 of these States have commenced participation in the *On the CUSP: Stop BSI* initiative; 22 of those States have hospitals that have been participating in the project and submitting data for over one year.

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[1] Vital Signs: Central Line-Associated Blood Stream Infections—United States, 2001, 2008, and 2009. Morbidity and Mortality Weekly Report. Atlanta, GA: Centers for Disease Control and Prevention; 2011 Mar 1;60. Available at: http://www.cdc.gov/mmwr/pdf/wk/mm60e0301.pdf.

[2] Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. N Engl J Med 2006 Dec 28;355(26):2725–2732.

Given the significance of AHRQ's investment in this project and the role that it plays in achieving HHS's HAI reduction goals, there is value in assessing the project to this point, with three specific goals in mind. A first goal is to examine progress made in recruiting U.S. hospitals to participate in the project. A second goal is to evaluate the impact of the project on CLABSI rates in these participating hospitals. Finally, this report seeks to identify areas where improvement must continue to occur for the project to achieve its stated goals.

METHODS

Data Source

This report uses data stored in the *On the CUSP: Stop BSI* National Database created and maintained by the MHA Keystone Center in Lansing, Michigan. Each month, the number of central line days and the number of CLABSIs observed in the participating hospital units are submitted into the National Database. Some hospitals submit infection rate data directly into this database, and others contribute data through CDC's National Healthcare Safety Network (NHSN). All participants use CDC definitions to count central line days and determine the number of CLABSIs observed in participating units.

All analyses are based on data drawn from the National Database on June 15, 2011. Because we want to recognize as many of the hospitals that have chosen to participate as possible, a complete list of hospitals that have contributed to the national project database can be found at the project Web site at www.onthecuspstophai.org.

Participation Measures

Data from the *On the CUSP: Stop BSI* National Database were linked to information in the 2009 AHA Annual Survey of hospitals based on hospital name, location, and AHA hospital identifier (when available and accurate). All hospitals that could be linked were classified by size using the "total beds staffed" variable from the AHA Annual Survey. Hospitals were also classified based on whether they were critical access hospitals, rural referral hospitals, members of a health care system, located in one of the 100 largest cities in the United States, or are considered a teaching hospital by AHA. Hospital characteristics were not available for those hospitals or for any hospitals that could not be matched to data in the AHA Annual Survey. Also excluded from the analyses were units without any baseline data (265 units) or without any followup data (15 units).

CLABSI Rates

CLABSI rates for the four cohorts were calculated for a baseline time period of up to 12 months before the CUSP intervention and for each subsequent 3-month time period (i.e., quarter). The time periods are shown below.

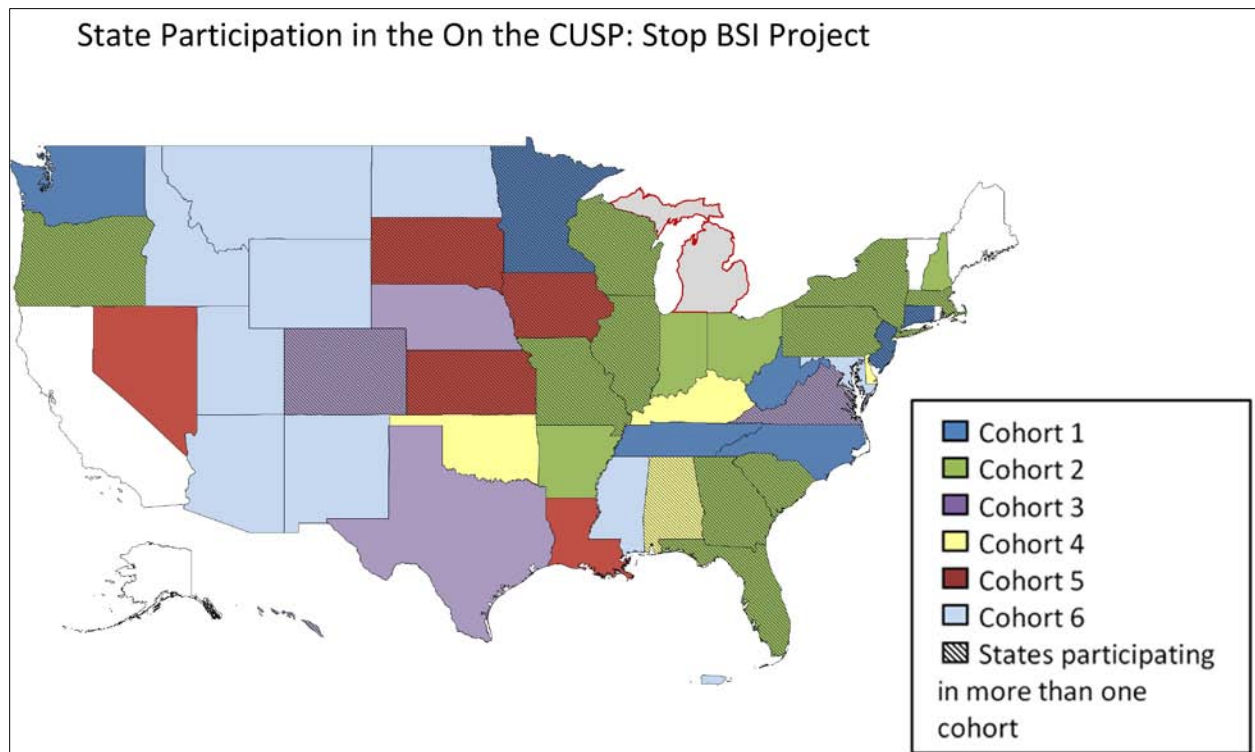|		2008								2009												2010												2011				
	Intervention Date	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Cohort 1	5/1/2009	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4	Q5	Q5	Q5	Q6	Q6	Q6	Q7	Q7	Q7	Q8	Q8	Q8	
Cohort 2	9/1/2009					Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4	Q5	Q5	Q5	Q6	Q6	Q6	Q7	Q7	Q7
Cohort 3	2/1/2010										Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4	Q5	Q5	Q5	Q6
Cohort 4	7/1/2010															Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4

Central line days were calculated as the sum of all reported central line days during the reporting period, while the number of CLABSIs equaled the sum total of all CLABSIs reported during the period. The unit level CLABSI rate equals the ratio of CLABSIs to central line days multiplied by 1,000.

RESULTS

Objective 1: Project Participation

State Participation. Recruitment to the project was an ongoing process that began in fall 2008 and ended in summer 2011. Lead organizations in States were encouraged to recruit as many teams of participants as they could. The ongoing success of this program, awareness of impending CMS public reporting of CLABSI rates, and the 2011 requirement that hospitals submit CLABSI data into NHSN encouraged additional hospitals to enroll. Once States agreed to participate, they were placed into a project group or "cohort" along with other States beginning the project at the same time. At present, 6 cohorts, including 44 States, the District of Columbia, and Puerto Rico are participating in the project. Because some State hospital associations recruited hospitals at different periods, more than one cohort can participate in a State at a given time. Figure 1 illustrates the current status of State recruitment efforts.

Figure 1: Participation by State*

State Participation in the On the CUSP: Stop BSI Project

Cohort 1
Cohort 2
Cohort 3
Cohort 4
Cohort 5
Cohort 6
States participating in more than one cohort

* Michigan and Rhode Island have previously engaged in the improvement effort to reduce CLABSIs. They are not included in this report.

Forty-four States, plus the District of Columbia and Puerto Rico, are participating in one of the six cohorts. Although Michigan is not listed as a formal project participant, Michigan hospitals

continue to work with the MHA Keystone Center on sustaining the exceptionally low CLABSI rates they achieved in the initial Keystone Project.[3,4]

Levels of participation within States vary substantially. Table 1 provides a breakdown of the number of participating hospitals and teams by State. Because some States have a higher percentage of very small hospitals that do not have an intensive care unit (ICU) or insert central lines, some variation in the percentage of hospitals in each State that could benefit from project participation is to be expected. Alabama, Delaware, Hawaii, Maryland, and Washington all have more than 50 percent of their hospitals participating in the project.

Table 1: Hospital and Team Participation by State
Information reflects data entered as of June 15, 2011

State	Total CUSP Units/ Teams*	Total CUSP Hospitals	Total Hospitals in State†	Recruitment Percentage - Total‡	Hospitals in State With an ICU	CUSP Hospitals With an ICU§	Recruitment Percentage - Hospitals With an ICU
AL	94	80	115	69.6%	70	57	81.4%
AR	54	28	95	29.5%	51	20	39.2%
AZ	17	9	82	11.0%	44	7	15.9%
CO	8	6	84	7.1%	43	5	11.6%
CT	18	15	35	42.9%	25	12	48.0%
DC	22	7	10	70.0%	8	6	75.0%
DE	14	8	7	114.3%	7	6	85.7%
FL	73	35	215	16.3%	116	31	26.7%
GA	59	35	154	22.7%	80	28	35.0%
HI	40	16	25	64.0%	15	14	93.3%
IA	20	12	118	10.2%	78	10	12.8%
ID	2	2	47	4.3%	17	2	11.8%
IL	88	45	189	23.8%	129	34	26.4%
IN	20	15	134	11.2%	87	13	14.9%
KS	55	44	146	30.1%	55	26	47.3%
KY	61	34	109	31.2%	60	29	48.3%
LA	17	13	192	6.8%	61	11	18.0%
MA	31	22	80	27.5%	52	19	36.5%
MD	84	45	49	91.8%	46	40	87.0%
MN	33	15	133	11.3%	68	7	10.3%
MO	26	21	134	15.7%	92	21	22.8%
MS	10	9	103	8.7%	47	9	19.1%
MT	20	6	52	11.5%	24	5	20.8%

[3] Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. N Engl J Med 2006 Dec 28;355(26):2725–32.

[4] Pronovost PJ, Goeschel CA, Colantuoni E, et al. Sustaining reductions in catheter-related bloodstream infections in Michigan intensive care units: an observational study. BMJ 2010 Feb 4;340:c309.

Table 1: Hospital and Team Participation by State - Continued

State	Total CUSP Units/ Teams*	Total CUSP Hospitals	Total Hospitals in State†	Recruitment Percentage - Total‡	Hospitals in State With an ICU	CUSP Hospitals With an ICU§	Recruitment Percentage - Hospitals With an ICU
NC	47	29	117	24.8%	84	n/a	n/a
ND	7	5	41	12.2%	18	5	27.8%
NE	18	8	90	8.9%	25	8	32.0%
NH	10	9	28	32.1%	25	9	36.0%
NJ	55	39	80	48.8%	57	35	61.4%
NM	2	2	43	4.7%	23	2	8.7%
NV	37	17	43	39.5%	19	8	42.1%
NY	29	22	191	11.5%	129	16	12.4%
OH	64	57	195	29.2%	135	n/a	n/a
OK	17	13	135	9.6%	50	10	20.0%
OR	13	10	59	16.9%	52	9	17.3%
PA	49	27	197	13.7%	130	20	15.4%
PR	24	15	53	28.3%	8	4	50.0%
SC	57	24	72	33.3%	54	21	38.9%
SD	12	7	58	12.1%	30	6	20.0%
TN	134	57	139	41.0%	59	37	62.7%
TX	58	34	520	6.5%	273	28	10.3%
UT	5	5	47	10.6%	22	4	18.2%
VA	62	30	91	33.0%	57	28	49.1%
WA	82	55	90	61.1%	54	n/a	n/a
WI	91	45	132	34.1%	84	38	45.2%
WV	30	20	58	34.5%	38	20	52.6%
WY	6	3	26	11.5%	17	3	17.6%

*Pronovost PJ, Goeschel CA, Colantuoni E, et al. Sustaining reductions in catheter-related bloodstream infections in Michigan intensive care units: an observational study. BMJ 2010 Feb 4;340:c309.
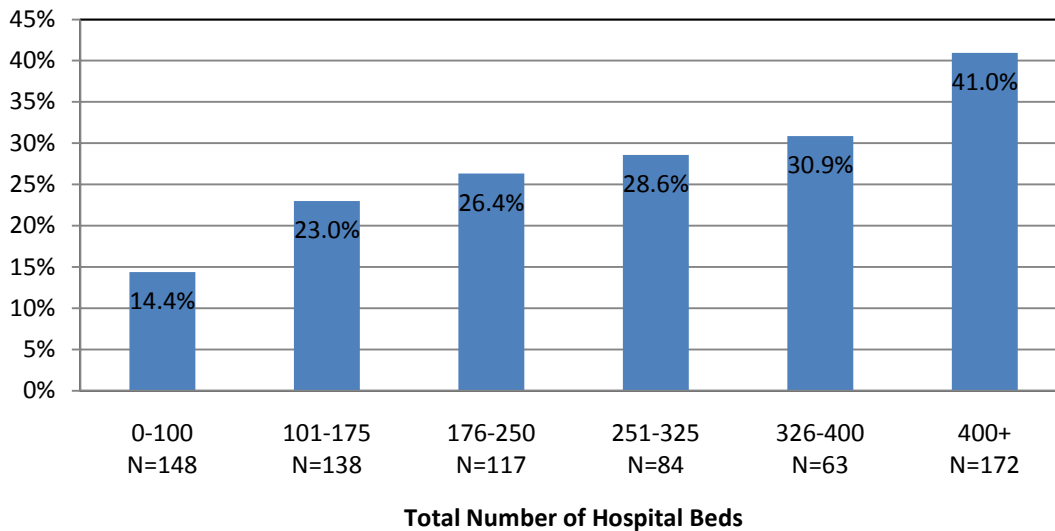
†"Total Hospitals in State" reflects those hospitals defined as "Community Hospitals" in the AHA Annual Survey and refers to all nonfederal, short-term and long-term general acute care hospitals. The recruitment percentage is calculated based on this number. There are instances where participating hospitals are not characterized as community hospitals, and these result in a recruitment percentage greater than 100.

‡"Total Hospitals in State" reflects those hospitals defined as "Community Hospitals" in the AHA Annual Survey and refers to all nonfederal, short-term and long-term general acute care hospitals. The recruitment percentage is calculated based on this number. There are instances where participating hospitals are not characterized as community hospitals, and these result in a recruitment percentage greater than 100.

§ This category denotes hospitals with some form of an ICU. The project is reporting this because this hospital designation accounts for the majority of project participants, as well as the majority of hospitals likely to insert central lines and to experience CLABSIs. Hospitals that do not submit data to the AHA Annual Survey may have ICUs that are not reflected in the ICU totals reported above.

Hospital Participation. Because CLABSIs can occur in all sizes and types of hospitals in which central lines are used, this project has encouraged each State lead organization to enlist the participation of all hospitals that use central lines. Figure 2 summarizes the participation of hospitals in this project based on their size (defined by the number of hospital beds). Percentages were based on the number of hospitals with an adult ICU of each size participating in the project divided by the total number of hospitals of each size with an adult medical or surgical ICU (based on data in the 2009 AHA Annual Survey).

Figure 2: Percentage of Participating Hospitals by Bed Size

	0-100 N=148	101-175 N=138	176-250 N=117	251-325 N=84	326-400 N=63	400+ N=172
	14.4%	23.0%	26.4%	28.6%	30.9%	41.0%

Total Number of Hospital Beds

Thus far, project recruitment has been strongest among hospitals with more than 400 beds and weakest among hospitals with fewer than 100 beds. Although small hospitals insert central lines in their ICUs, the number of insertions is often very low; this perhaps has made CLABSI prevention a lower priority for these hospitals.

Figure 3 summarizes the recruitment levels for hospitals with a range of characteristics.   More than 33 percent of teaching hospitals with ICUs are participating in the project. The involvement of rural referral hospitals, hospitals from the 100 largest cities, and hospitals that are part of hospital systems is slightly lower.

Figure 3: Percentage of Participating Hospitals by Characteristic
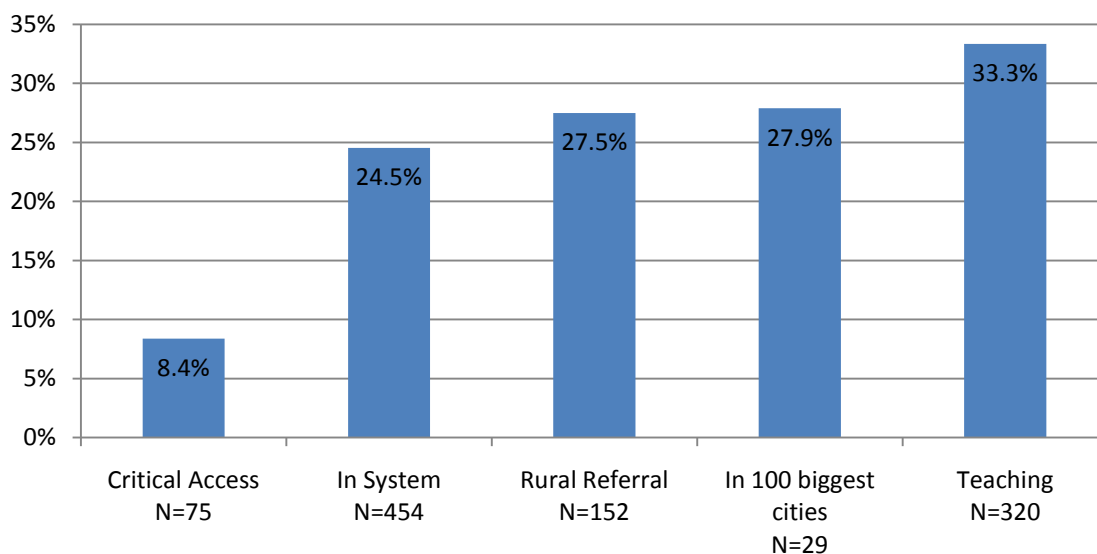
The list of participating hospitals maintained on the project Web site at www.onthecuspstophai.org provides the best source of current information on which hospitals have chosen to participate. Ohio and Washington have not provided the names of participating hospitals, so those are not included. While the list on the Web site includes every hospital that has been enrolled in the national project database, some hospitals on this list may not be continuing to submit CLABSI data or participating in scheduled project activities on a regular basis.

Unit Team Participation. Because the vast majority of central lines are placed in patients in an ICU, recruiting ICU teams has been the project's primary focus. However, some central lines are placed and maintained in non-ICU units. Thus, teams representing these units are also participating. At present, some pediatric or neonatal ICUs are participating in the project; HRET is working with other organizations that specialize in pediatric care to provide focused guidance to hospitals seeking to prevent CLABSIs in neonatal ICUs. Figure 4 illustrates the range of units participating in cohorts 1 through 6 of the *On the CUSP: Stop BSI* initiative.

Figure 4: Percentage of Participation by Unit Type
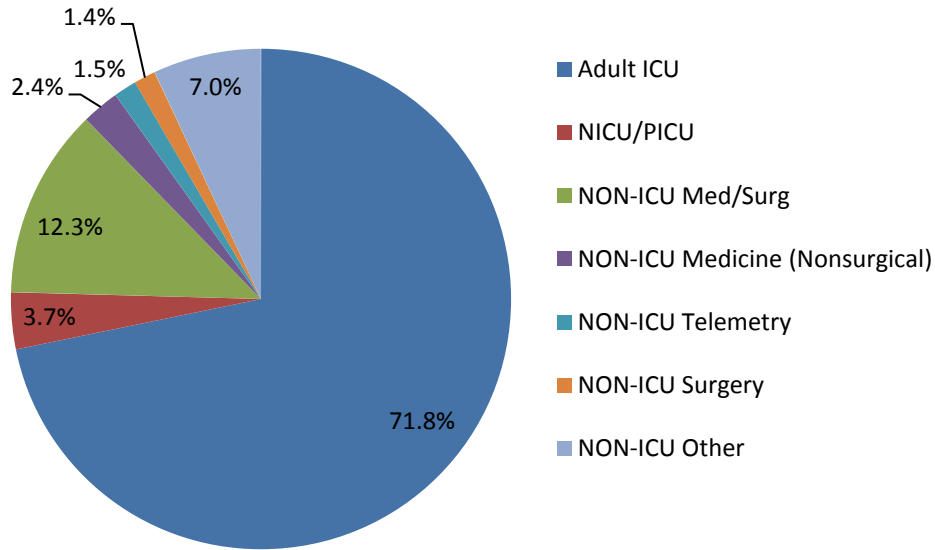
More than 75 percent of units participating in the project are ICUs; the majority are adult ICUs.

Objective 2: Impact Evaluation

While participation of hospitals is critical, the ultimate measure of success is the reduction of CLABSI rates. Table 2 summarizes the impact of the project on CLABSI rates from baseline through the first 12 months of the intervention period. The table includes units (N=883) that reported data in one or more (but not necessarily all) of the first four reporting periods for the first four cohorts participating in the project. Table 2 indicates CLABSI rates have dropped from an average of 1.87 infections per 1,000 central line days to 1.25 infections per 1,000 central line days, an overall relative reduction of 33 percent.

Table 2: Average CLABSI Rates
Cohorts 1–4 with units reporting during any of the four time periods
Information reflects data entered as of June 15, 2011

|	Baseline	Period 1	Period 2	Period 3	Period 4
	12 Months Before Intervention	Months 1–3 Post Intervention	Months 4–6 Post Intervention	Months 7–9 Post Intervention	Months 10–12 Post Intervention
Number of States	31	32	32	32	32
Number of Units reporting	725	850	858	860	803

Table 2: Average CLABSI Rates - Continued

	Baseline	Period 1	Period 2	Period 3	Period 4
	12 Months Before Intervention	Months 1–3 Post Intervention	Months 4–6 Post Intervention	Months 7–9 Post Intervention	Months 10–12 Post Intervention
Average CLABSIs/Unit	3.27	0.84	0.70	0.64	0.48
Average CL days/Unit	1,698	462	482	487	412
Average BSI Rate	1.87	1.58	1.23	1.22	1.25
95% Confidence Interval	(1.690, 2.055)	(1.401, 1.759)	(1.085, 1.380)	(1.049, 1.394)	(0.807, 1.691)
Change From Baseline*	n/a	-0.29	-0.64	-0.65	-0.62
95% Confidence Interval	n/a	(-0.549, -0.036)	(-0.872, -0.408)	(-0.903, -0.399)	(-1.119, -0.128)

*Based on an unmatched comparison of CLABSI rates between time periods

Figure 5 presents the percentage of units (N=660) who achieved a zero percent CLABSI rate in each reporting period. This percentage has increased 154 percent since baseline, from 27.3 percent to 69.6 percent. Working to assist units that have not achieved this rate remains a top project priority.

Figure 5: Percent of Reporting Units With Zero Percent CLABSI Rate (Cohorts 1–4)*
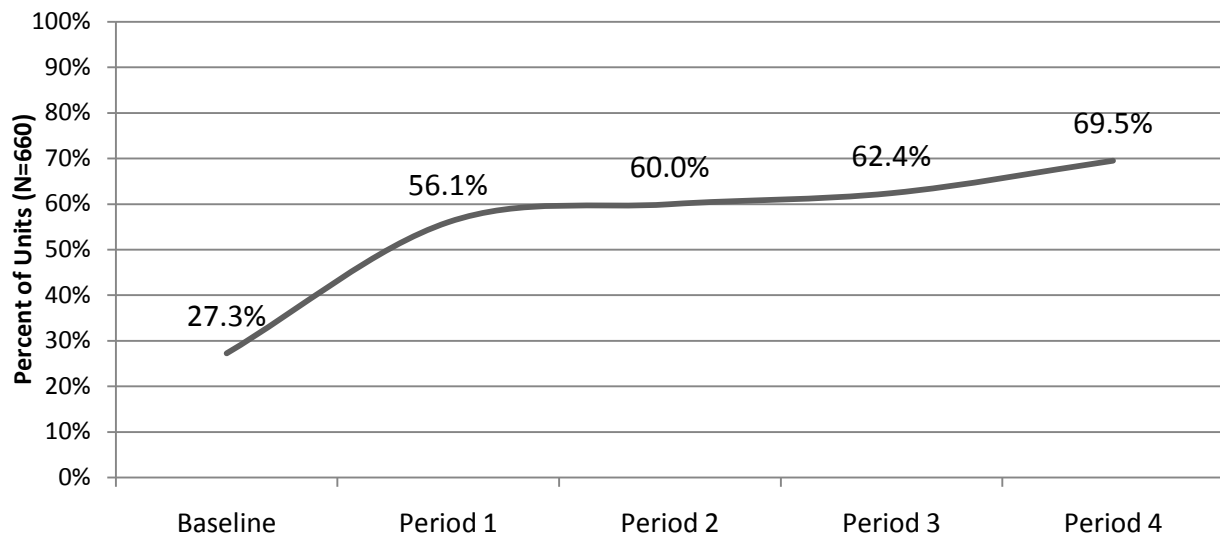
* To achieve a zero percent CLABSI rate, a unit had to report no CLABSIs for each data point submitted during the period.

Hospital-Level Data

Examining the data at the hospital level (rather than the unit level) indicates that the largest hospitals (400 beds or more) had the greatest drop in CLABSI rates from baseline to period 4 at 44 percent. Hospitals with a bed size between 176 and 250 had the next greatest drop at 41.8 percent. The smallest hospitals with 100 or fewer beds had the lowest decrease in CLABSI rates at 10 percent (Figure 6).
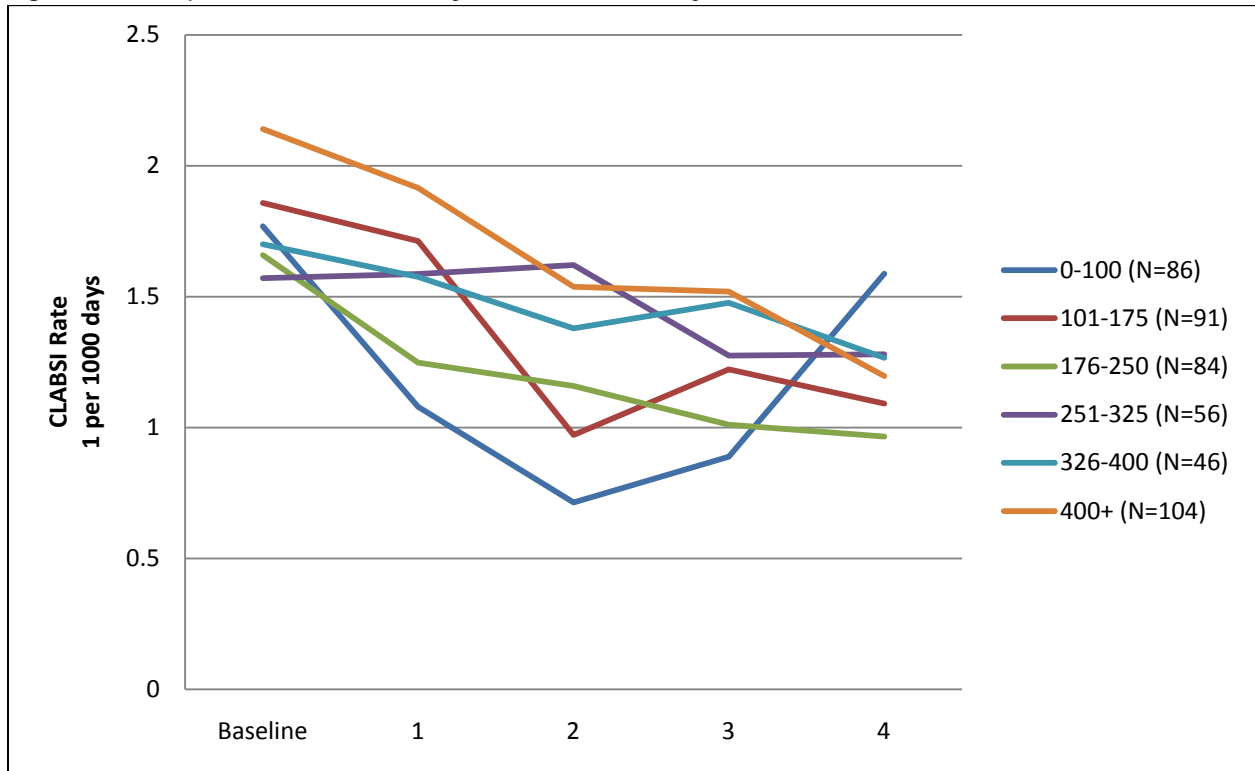
Figure 6: Hospital CLABSI Rates by Bed Size and Project Quarter

Figure 7 indicates that all types of hospitals decreased their CLABSI rates over time. Referral hospitals' CLABSI rates dropped 69 percent from the baseline period to period 4. Teaching hospitals and hospitals in systems decreased their CLABSI rates by 42 percent and 41 percent respectively over 12 months. Critical-access hospitals decreased their CLABSI rates by 100 percent, although data were available for only 12 hospitals in this category. Further investigation on the performance of smaller hospitals is warranted.

Figure 7: Hospital CLABSI Rates by Type
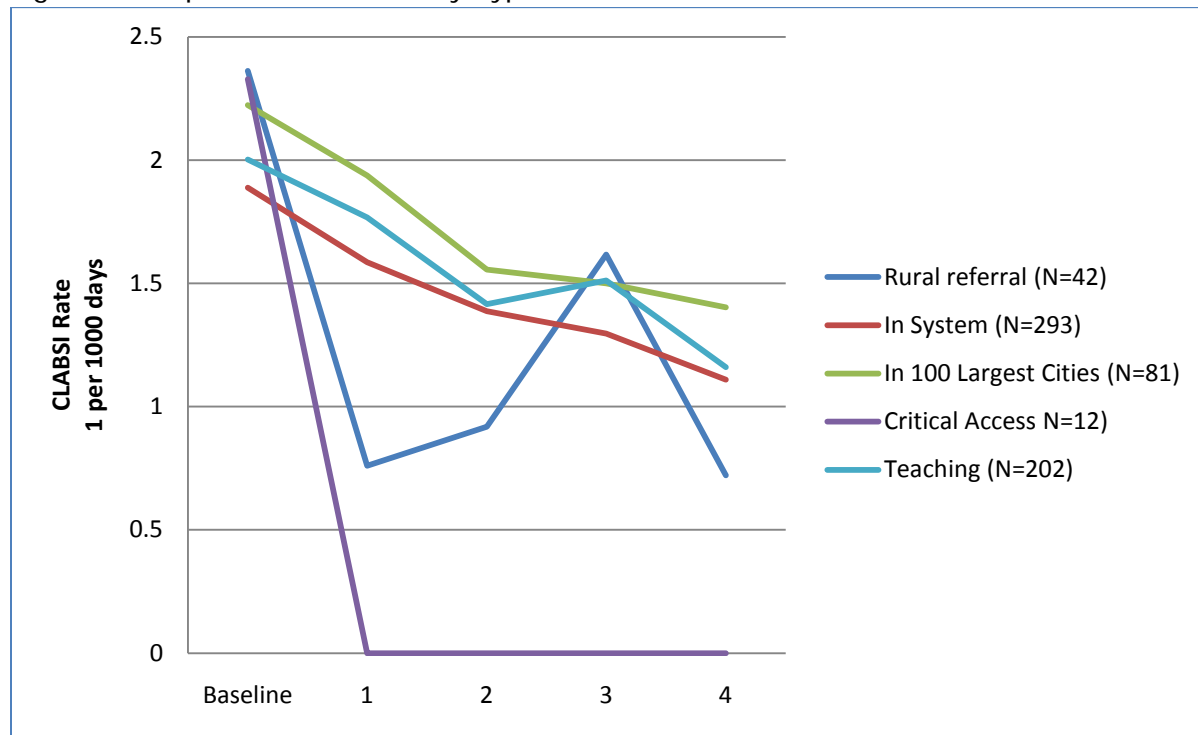
Objective 3: Improvement of Safety Culture

The third project objective is the improvement in safety culture in participating units. Significant and sustained improvement in a clinical outcome such as CLABSI requires a culture in which all staff members understand and can be held accountable for ensuring the safety of patients. To assess progress in culture change, participating units are asked to complete the Hospital Survey on Patient Safety Culture (HSOPS) survey at the start and end of the project. The followup surveys are administered at 18 months, which may not be enough time to capture the change in culture.

Clinical changes require and reinforce changes in safety culture. The HSOPS is a staff survey designed to help hospitals assess the culture of safety in their institutions. Units are expected to both reduce BSIs and improve HSOPS scores. Each unit was asked to administer HSOPS at baseline and at followup. Since many units are still participating in the project and have not remeasured their safety cultures, we compared the scores for 156 units that have baseline and remeasurement results. Baseline and follow up response rates for those units included in the analysis are 72.13 percent and 58.83 percent, respectively.

Figure 8 indicates that for these units, there was little change in attitudes between the baseline (response rate of 72.13 percent) and followup surveys (response rate of 58.83 percent). Feedback and communication about errors continues to be the area where the most improvement is needed in patient safety culture, followed by staffing issues and teamwork across units. Because units have far fewer HSOPS respondents than hospitals, interpreting unit-level results is challenging. Future analyses based on a larger number of participating units will be needed to determine whether HSOPS data is useful at the unit level and whether the project affected staff perceptions of safety culture.

Figure 8: Change in Patient Safety Culture, by Patient Safety Culture Dimensions
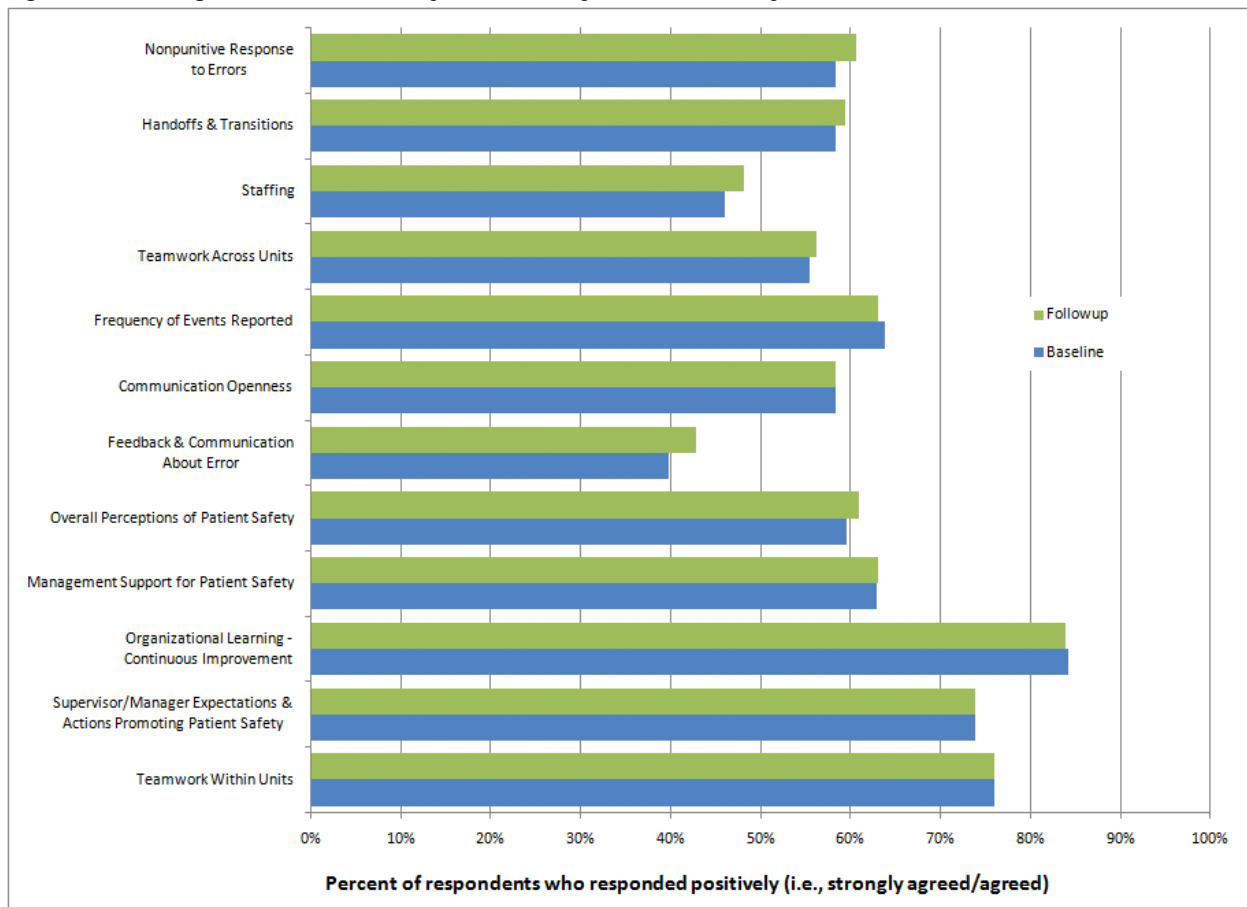
AREAS FOR CONTINUED IMPROVEMENT

Although the results described above indicate that the project is making substantial progress toward achieving its recruitment and CLABSI reduction goals, opportunities for improvement remain. The three most important areas for improvement are:

1. Targeted interventions for high-rate units: A substantial majority of participating units report CLABSI rates of zero in any given project quarter. A relatively small percentage of units with CLABSI rates over 5 per 1,000 central line days are the primary reason that the average CLABSI rate remains above 1.0. In the last 6 months, the national project team has been identifying these facilities, encouraging the State hospital associations to discuss their rates with them, and developing resources to support the needs of these units. The success of these efforts to target high CLABSI rate units will have a significant impact on the ability of the project to meet its overall goals.
2. Data submission: Not all of the units have submitted CLABSI rate data in each of the reporting periods. While data submission does not improve CLABSI rates, a failure to continuously monitor CLABSIs and use each infection to identify processes that must be improved to prevent them in the future will not lead to sustained improvement. The national leadership of the project is working closely with the lead organizations in every participating State to encourage all participating hospitals to remain fully engaged in the project for its duration and in the monitoring and reporting of their CLABSI rates.
3. Sustainability: While the rates of participating units have dropped substantially during the first year of participation in the project, sustaining the reduced rates and driving them even lower over time requires a sustainable intervention at both the hospital and the State levels. HRET is developing strategies for the State lead organizations to sustain the improvements that have been made and to extend them to other units in participating hospitals as well as other hospitals that chose not to participate in the initial project.

CONCLUSION

The national project team continues to conduct analyses to better understand which units are succeeding, which are struggling, and why, so that changes may be made to the initiative to maximize its impact for every participating hospital. Better understanding the root causes of CLABSIs that continue to occur sporadically in even high-performing units may also lead to important insights. Continuing to help hospitals correctly count central line days and identify CLABSIs is vital to efforts to prevent them and to increase public confidence that this risk to patient safety is being reduced or even eliminated. While much of the work on this national initiative still remains, the results in this report indicate that significant progress is being made toward achieving its goals.