

# Healthcare-Associated Infections

## Report Highlights

- The percentage of hospitals reporting zero infections for the five HAIs measured has declined dramatically since 2015. This trend puts patients at higher risk for numerous complications and longer recoveries and is cause for concern.
- The majority of hospitals reporting to the 2017 Leapfrog Hospital Survey had fewer infections than would have been expected, although some facilities still have extremely high SIRs — endangering patients' lives and increasing the cost of care.
- Hospitals that report as part of the same health system (under the same Medicare Provider Number) sometimes show significant variation on HAIs. Leapfrog reports by individual facility, providing critically needed transparency for patients evaluating hospitals for care.

Healthcare-associated infections (HAIs) are a common and complicating — yet largely preventable — factor for hospitalized patients. Each day, around one out of 25 patients in U.S. hospitals contracts an HAI.<sup>1</sup> These infections can significantly delay recovery, increase the expense of a hospital stay, and even result in death. Of the approximately two million American patients who acquire an HAI annually, an estimated 90,000 will die.<sup>2</sup> Yet studies have shown that selected HAIs can be reduced by as much as 70% with the help of the proper patient-safety interventions.<sup>3</sup> The cost of a single case can range from just under \$1,000 to nearly \$50,000<sup>4</sup>, depending upon the type of infection — with the direct cost of HAIs to hospitals estimated at between \$28 billion and \$45 billion.<sup>5</sup> These costs are passed along to insurers and employers, as well as to patients themselves in the form of higher out-of-pocket costs.

The 2017 Leapfrog Hospital Survey reports on five infection measures:

- **CLABSI** — Central line-associated blood stream infections in ICUs and select wards
- **CAUTI** — Catheter-associated urinary tract infections in ICUs and select wards
- **MRSA** — Inpatient, hospital-onset Methicillin-resistant *Staphylococcus aureus* infections
- **C. diff** — Inpatient, hospital-onset *Clostridium difficile* infections
- **SSI: Colon** — Surgical site infections following major colon surgery

To track these infections, Leapfrog relies on **standardized infection ratios (SIRs)** developed by the Centers for Disease Control and Prevention (CDC). SIRs are adjusted for risk factors that may impact infection rates, allowing for comparisons among diverse hospitals. Factors accounted for

**FIGURE 1: HAI Standards Measured in this Report**

	WHAT IT IS*	WHERE IT'S MEASURED	FACTORS INCLUDED IN RISK ADJUSTMENT
<b>Central line-associated blood stream infections (CLABSI)</b>	Infections that occur when bacteria or viruses enter the bloodstream through a central line (venous catheter). Can occur when a central line is not inserted or maintained properly.	Intensive care units (ICUs), neonatal intensive care units (NICUs), and medical, surgical, and medical/surgical wards	Type of hospital, medical school affiliation, number of beds in facility, types of locations within a hospital (ICU, ward, and so on), patient's birth weight for NICU patients
<b>Catheter-associated urinary tract infections (CAUTI)</b>	Infections in the urinary system caused by a urinary catheter. Can occur when a urinary catheter is not inserted or maintained properly or is used for a prolonged period of time.	ICUs and medical, surgical, and medical/surgical wards	Type of hospital, medical school affiliation, number of beds in facility, types of locations within a hospital (ICU, ward, and so on)
<b>Inpatient, hospital-onset Methicillin-resistant Staphylococcus aureus (MRSA)</b>	Infections from a type of staph bacteria resistant to certain antibiotics, including methicillin and other more common antibiotics. MRSA commonly causes skin infections, but can also lead to pneumonia and other serious issues.	Facility-wide	Type of hospital, medical school affiliation, number of ICU beds, average length of stay, admission prevalence rate of MRSA infections, number of MRSA infections in emergency department and/or observation units
<b>Inpatient, hospital-onset Clostridium difficile infections (C. diff)</b>	Infections that cause inflammation of the colon. C. diff bacteria are found in feces, and infections can occur from touching any surface that has been contaminated.	Facility-wide	Type of hospital, medical school affiliation, number of beds in facility, number of ICU beds, admission prevalence rate of C. diff infections, type of laboratory test used to identify C. diff infections, whether the hospital does C. diff testing in emergency department and/or observation units
<b>Surgical site infections following major colon surgery (SSI: Colon)</b>	Infections that occur at surgical sites after colon surgery. SSIs may sometimes require a second surgery to specifically treat the infection.	Adult patients (18 years and older) in medical, surgical, and medical/surgical wards	Patient gender, diabetes status, age, and BMI — plus type of hospital, American Society of Anesthesiologists (ASA) score, type of surgical closure used

\* Leapfrog uses the same HAI measures that are used by the Centers for Medicare & Medicaid Services (CMS), obtaining its HAI data directly from the CDC's National Healthcare Safety Network (NHSN) — the nation's most widely used healthcare-associated infection tracking system. In 2017, the CDC updated its calculation of Standardized Infection Ratios (SIRs) using 2015 data. While this provides a more recent reference point for comparisons going forward, no comparisons to previous years can be made this year.

in these ratios can range from the type and size of a hospital to the type of unit reporting within a facility — such as a surgical ward or burn unit — and whether or not a hospital is affiliated with a medical school.

Leapfrog uses these CDC-devised ratios to compare the actual number of HAIs reported to what would have been predicted for that facility, given national 2015 aggregate data and various facility and/or patient-level factors. A SIR of 1.0 means the number of HAIs is exactly what would have been expected. Less than 1.0 means there were fewer HAIs than predicted; more than 1.0 indicates more HAIs than would have been predicted.

## Cause for Concern: Many Hospitals Losing Ground on Zero Infections

Every hospital in the U.S. should be striving to eliminate all HAIs from their facilities. Unfortunately, many reporting hospitals have been moving in the wrong direction. Since 2015, the percentage of hospitals achieving zero infections has declined dramatically. For some hospitals, this may be due to increased awareness and better tracking of infections. Further, CLABSI and CAUTI measures now include data from additional ICUs as well as medical, surgical, and medical/surgical wards — which increases exposure to infections and could factor into the decline in the number of hospitals

with zero HAIs. Regardless, this reversal is dramatic enough to raise serious concerns over the rising threat to patients.

For example, the percentage of hospitals reporting zero CLABSIs has been cut nearly in half, from 25.0% in 2015 to 12.7% in 2017. The percentage of institutions with zero MRSA infections has decreased by more than half in just one year — from 30.6% in 2016 to 14.6% in last year’s survey. These steep declines put patients at significant risk of additional complications and troublesome recoveries, not to mention added expense for employers and purchasers.

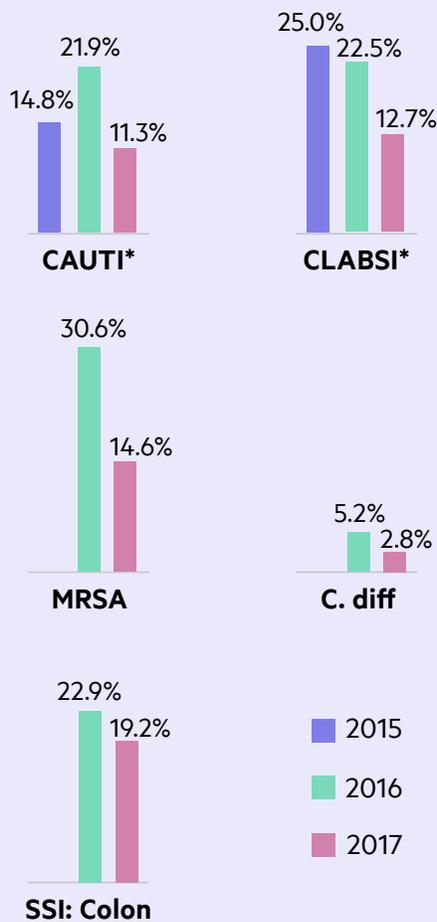
## Good News: Majority of Hospitals Faring Better Than Expected

Offsetting the worrisome decline in the percentage of hospitals reporting zero HAIs to the 2017 Leapfrog Hospital Survey is the fact that the majority of reporting hospitals today are doing better than would have been predicted based on 2015 national data. More than six in ten hospitals are achieving infection ratios of between 0.000 and 1.000 on each of the five HAIs measured.

Still, far too many hospitals have rates of infection that exceed what would be expected — up to double, triple, or even higher than the predicted infection rates.

**FIGURE 2: Hospitals with Zero HAIs Dramatically Declining**

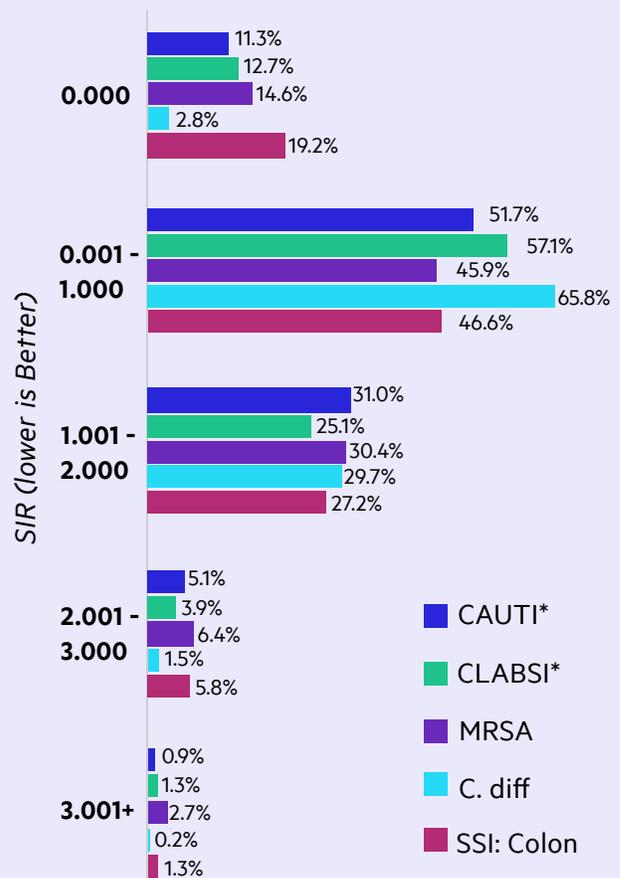
### Percent of hospitals with zero HAIs



\* Starting in 2017, CLABSI and CAUTI measures include data from additional ICUs, as well as medical, surgical, and medical/surgical wards

**FIGURE 3: How Reporting Hospitals Measure up on 5 HAIs**

### Percent of hospitals per Standardized Infection Ratio (SIR)



## Pooled SIRs Explain Aggregate Hospital Performance

Another way of assessing progress hospitals are making toward reducing HAIs is to look at “pooled SIRs.” A pooled SIR is essentially a weighted average that adjusts infection ratios to account for the increased impact of larger facilities or those with more predicted infections versus those that are smaller or have fewer expected infections.

A pooled SIR sums all numerators (the total number of infections across all hospitals) and divides that by all denominators (the total number of infections predicted across those hospitals).

**FIGURE 4: Reporting Hospitals’ Aggregate Performance on HAIs**

MEASURE	POOLED SIR	INTERPRETATION
CLABSI	0.841	On average, 15.9% fewer CLABSIs than would be predicted
CAUTI	0.910	On average, 9.0% fewer CAUTIs than would be predicted
MRSA	0.939	On average, 6.1% fewer MRSA infections than would be predicted
C. diff	0.866	On average, 13.4% fewer C. diff infections than would be predicted
SSI: Colon	0.901	On average, 9.9% fewer SSIs following major colon surgery than would be predicted

## Leapfrog Provides Critically Needed Transparency by Reporting by Facility

Although the Centers for Medicare & Medicaid Services’ (CMS) Hospital Compare website reports HAI data, CMS consolidates this data for some institutions by Medicare Provider Number (MPN), and reports one rate for an entire health system. This can obscure important variations among high- and low-performing hospitals that share a MPN.

Leapfrog is the only agency that reports by individual hospital or brick-and-mortar facility. This enables prospective patients to evaluate how each individual hospital — not a system as a whole — performs on HAIs. This transparency is critical information for individuals to consider when choosing a hospital. For example, two hospitals just seven miles apart within one health system on the east coast reported CLABSI SIRs to Leapfrog of 0.000 and an alarming 3.755, yet CMS Hospital Compare reported only one SIR for both facilities combined of 1.775. Similarly, in the Southeast, a four-hospital system within a 12-mile radius reported SSI: Colon SIRs ranging from 0.000 to 1.977, while CMS Hospital Compare reported all four facilities with a single SIR of 0.825.

## What Patients and Employers Can Do

Fortunately, there are effective actions patients can take to mitigate the risk of acquiring a healthcare-associated infection. Here are a few suggestions<sup>7</sup>:

-  Use the Leapfrog Hospital Survey results to research specific hospitals under consideration and learn what their HAI rates are
-  Ensure that all healthcare professionals and visitors wash their hands before and after every patient encounter
-  Wash hands after touching bed rails, bedside tables, remote controls, or phones and before eating or touching the eyes, nose, or mouth
-  Ask why a central line or catheter is needed for a particular procedure and follow up periodically with the doctor or nurse to see if it’s still required
-  Notify someone immediately if the area around a central line, catheter, or wound is red, swollen, warm, or draining
-  Understand how to care for a surgical wound at home before leaving the hospital
-  Keep taking any antibiotics as prescribed — never stop before finishing a prescribed course

Employers should also fully appreciate the danger of healthcare-associated infections in terms of delaying recoveries, endangering employees' health through unnecessary complications, and increasing medical costs for their organizations and employees. Employers should use this information when contracting for health insurance, making payments, or reporting data to educate their employees on the best hospitals for care.

## The Leapfrog Hospital Survey

The Leapfrog Group invites all adult general acute care and free-standing pediatric hospitals in the United States to voluntarily report on topics such as maternity care, healthcare-associated infections, medication safety, safe practices for better healthcare, and never events through its annual Survey. In 2017, nearly 2,000 hospitals submitted a Survey, representing two-thirds of inpatient beds nationwide. This report uses final hospital data from the 2017 Leapfrog Hospital Survey (data submitted through December 31, 2017).

The Leapfrog Hospital Survey includes measures that are endorsed by the National Quality Forum

(NQF) and/or aligned with those of other significant data collection entities, including the Centers for Medicare & Medicaid Services (CMS) and The Joint Commission. Leapfrog partners with the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine to review Survey measures and standards, and updates them annually to reflect the latest science. Additionally, panels of volunteer experts meet regularly to review the Survey measures and recommend performance standards for each subject area covered in the Leapfrog Hospital Survey. The full list of measures included in the Survey is available at [www.leapfroggroup.org/survey](http://www.leapfroggroup.org/survey).

The standardized infection ratio (SIR) is a summary measure used to track HAIs at a national, state, or local level. Leapfrog aligns with the CDC's National Healthcare Safety Network (NHSN). In January of 2017, the CDC updated its methodology for calculating SIRs using 2015 national aggregate data. Previously, the CDC used data from 2006 – 2009, depending upon the specific measure. Because of this, SIRs in the 2017 Leapfrog Hospital Survey cannot be compared to prior years. For additional information, see the [NHSN SIR guide](#).

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6. Centers for Disease Control and Prevention
7. Centers for Disease Control and Prevention

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Founded in 2000 by large employers and other purchasers, [The Leapfrog Group](#) is a national nonprofit organization driving a movement for giant leaps forward in the quality and safety of American health care. The flagship [Leapfrog Hospital Survey](#) collects and transparently reports hospital performance, empowering purchasers to find the highest-value care and giving consumers the lifesaving information they need to make informed decisions. [The Leapfrog Hospital Safety Grade](#), Leapfrog's other main initiative, assigns letter grades to hospitals based on their record of patient safety, helping consumers protect themselves and their families from errors, injuries, accidents, and infections.



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