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HAI Summary Data Reports: Questions and Answers

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About the Reports [box]

CDC collects and analyzes national and state healthcare-associated infections (HAI) data that healthcare organizations can use to decrease infection rates in their facilities.

What are the NHSN summary data reports?

CDC's [National Healthcare Safety Network](#) (NHSN) summary data reports give a snapshot of how the country is doing in preventing healthcare-associated infections (HAI). These summary reports describe incidence rates for the following types of HAI:

- Central line-associated bloodstream infections (CLABSI)
- Surgical site infections (SSI)
- Catheter-associated urinary tract infections (CAUTI)

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The reports are based on data reported to the CDC's NHSN. The NHSN provides a secure way for healthcare facilities to track HAI data. The data are used to calculate a [standardized infection ratio \(SIR\)](#) for each reporting state and facility.

How are the reports used to prevent HAI?

The data in these reports can be useful to federal, state, and local government; healthcare facilities; and patient safety organizations that want to lower HAI rates.

- From a national perspective, the data measure progress toward the HAI prevention goals outlined in the U.S. Department of Health and Human Services (HHS) [Action Plan to Prevent Healthcare-associated Infections](#).
- At the state level, the information helps assess the impact of [state-based HAI prevention programs](#). It also indicates any local facilities that have significantly more infections than others in the area.

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What's the benefit of reporting HAI data?

Research shows that when healthcare facilities and clinicians are aware of infection problems and take specific steps to prevent them, rates of certain HAI can decrease by more than 70 percent. Infection data can give healthcare facilities and public health agencies the knowledge they need to design, implement, and evaluate prevention strategies that protect patients and save lives.

CDC believes that public reporting of HAI rates is an important part of overall healthcare transparency efforts and of national HAI elimination.

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Why is NHSN a good tool for measuring HAI rates?

With 11,500 facilities participating, NHSN is the largest HAI reporting system in the United States. NHSN provides standard methods and definitions, online training modules, user support, and facility comparison tools. Nearly all U.S. hospitals and dialysis facilities are able to successfully report to NHSN, making it an important tool for national HAI tracking and elimination.

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Is my state mandated to report HAI data?

Currently, 33 states and the District of Columbia have legislated mandates for reporting. Most of these (30 states plus the District of Columbia) use NHSN to meet the requirement. For more information, see the [state-based HAI prevention](#) website.

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How can I connect my facility to NHSN?

- To enroll your facility in NHSN, you'll need to contact the local or [state health department](#).
- You can also review CDC's [prevention tools](#) and [guidelines](#) for facilities and states.
- You can get more information on the [NHSN web site](#).

Report Findings

Have central line-associated bloodstream infections decreased?

The reports show a national decrease in the incidence of central line-associated bloodstream infections (CLABSI). As of 2011, CLABSI are down nationally by 41 percent. These encouraging findings reflect the work of clinicians and facilities; local, state, and federal government; and cross-cutting partnership groups that have taken on CLABSI prevention efforts. We hope that all states and healthcare facilities will be motivated to continue and strengthen efforts to prevent CLABSI.

A central line is a tube placed in a large vein of a patient's neck or chest to give important medical treatment. When not put in correctly or kept clean, a central line can become a highway for germs to enter the body and cause a serious bloodstream infection.

HHS has set a goal of reducing CLABSI nationally by 50 percent by the end of 2013.

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Have surgical site infections decreased?

As of 2011, surgical site infections (SSI) are down nationally by 17 percent; however, there is a wide variation in SSI rates for specific procedures. At continuously reporting hospitals, only SSI following hip arthroplasty decreased from 2010 to 2011. This means there are still substantial opportunities to improve prevention efforts across many surgical procedures. The report includes a national snapshot of the infection risk linked to the following [common surgical procedures](#): hip arthroplasty, knee arthroplasty, coronary artery bypass graft, cardiac surgery, peripheral vascular bypass surgery, abdominal aortic aneurysm repair, colon surgery, rectal surgery, abdominal hysterectomy, and vaginal hysterectomy.

HHS has set a goal of reducing SSI nationally by 25 percent by the end of 2013.

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Have catheter-associated urinary tract infections decreased?

As of 2011, catheter-associated urinary tract infections (CAUTI) are down nationally by 7 percent. The reports show a [national decrease in \(CAUTI\)](#) from 2009 to 2010; however, there was no additional reduction from 2010 to 2011. CAUTI rates were down moderately among patients in general wards, but there was basically no reduction of CAUTI rates in critical care

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patients between 2010 and 2011.

Reducing CAUTI among critical care patients is a special concern because these infections drive antibiotic use. While antibiotics are essential for treating bacterial infections, they also increase patients' risk for complications. One potentially deadly complication is severe diarrhea caused by the bacteria *Clostridium difficile*.

HHS has a goal of reducing CAUTI nationally by 25 percent by the end of 2013.

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What's a standardized infection ratio?

The standardized infection ratio (SIR) is a summary measure used to track HAI over time. It compares actual HAI rates in a facility or state with baseline rates in the general U.S. population. The SIR is adjusted for risk factors that are most associated with differences in infection rates.

In other words, the SIR takes into account that different healthcare facilities treat different types of patients. For example, HAI rates at a hospital that has a large burn unit (where patients are at higher risk of acquiring infections) can't be directly compared to a hospital that doesn't have a burn unit.

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How is the SIR calculated?

The method of calculating an SIR is similar to the method of calculating the Standardized Mortality Ratio (SMR), a statistic that's widely used by public health researchers to analyze mortality data.

The SIR is adjusted differently depending on the infection rate being measured. The SIR for CLABSI and CAUTI are adjusted by:

- type of patient care location
- hospital affiliation with a medical school
- bed size of the patient care location

Other factors, such as facility bed size, aren't associated with differences in the SIR, so they aren't part of the risk adjustment.

The SIR for SSI take into account all known procedure-related risk factors, in order to adjust for patient differences within each type of surgery. Surgical risk factors include:

- duration of surgery
- surgical wound class
- use of endoscopes
- re-operation status

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- patient age
- patient assessment at time of anesthesiology

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What does the SIR say about HAI rates?

If the SIR is **less than 1**:

- Infection rates have decreased since the baseline period.
- The number of infections reported in 2011 is lower than the number of predicted infections.
- Usually, low SIR reflect the results of robust HAI prevention strategies. These scenarios are exciting, and CDC is working with facilities and states to learn and share best practices.
- CDC is also considering the degree, if any, of under-reporting in the data. It's important to note that these reports aren't meant to compare states — they're meant to track the results of each state's prevention efforts over time.
- It's also important to note that while an SIR of less than 1 is a positive finding, it doesn't mean the work is done. Progress has been made toward reducing infections, but research has shown that HAI rates can be reduced even more.

If the SIR is 1:

- No progress has been made toward reducing infections since the baseline period.
- The number of infections reported in 2011 is the same as the number of predicted infections.

If the SIR is **greater than 1**:

- Infection rates have increased since the baseline period.
- The number of infections reported in 2011 is higher than the number of predicted infections.
- A high SIR usually reflects a need for stronger HAI prevention efforts.
- Other factors may also play a role in a high SIR, such as data validation that leads to the discovery and reporting of more infections than in previous years.

The SIR is used to figure out the percent change in infection rates for each type of HAI. The method for calculating the percent change is described in the table below.

To calculate a percent reduction (SIR less than 1):	To calculate the percent increase (SIR greater than 1):
1 minus the SIR = percent reduction.	SIR minus 1 = percent increase.
For example, with an SIR of 0.80: <ul style="list-style-type: none">• $1.00 - 0.80 = 0.20$	For example, with an SIR of 1.25: <ul style="list-style-type: none">• $1.25 - 1.00 = 0.25$

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<ul style="list-style-type: none">• 0.20 = 20 %• So, an SIR of 0.80 means there was a 20 percent reduction in 2011 from the baseline period.	<ul style="list-style-type: none">• 0.25 = 25 %• So, an SIR of 1.25 means there was a 25 percent increase in 2011 from the baseline period.
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What's the "predicted number of infections"?

The predicted number of infections (also called the standard population) is an estimate based on infections reported to NHSN in January 2006–December 2008. The number is risk-adjusted and includes data from all facilities, whether or not they're under state mandates. To calculate a state or facility's SIR for a certain time period, CDC compares the standard population number to the number of infections reported in that time period.

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Prevention Initiatives

How many high-SIR healthcare facilities did the report find?

In each major location group and procedure category, between 2% and 9% of the facilities reported SIR significantly greater than 1. An SIR greater than 1 means that more infections were observed than predicted.

The following table shows the total number of facilities that had an SIR significantly greater than 1 for different types of HAI. These numbers are relatively small compared to the total number of facilities that reported data in 2011.

Type of HAI	Number of facilities with high SIR for this HAI in 2011
Central line-associated bloodstream infections (CLABI)	54
Catheter-associated urinary tract infections (CAUTI)	133
Surgical site infections (SSI) associated with hip arthroplasty	25
Surgical site infections (SSI) associated with knee arthroplasty	30
Surgical site infections (SSI) associated with colon surgery	20
Surgical site infections associated with abdominal hysterectomy	15

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Focusing prevention efforts on these facilities is one strategy for efficient use of resources in coming years.

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What's CDC doing about high-SIR facilities?

CDC is these facilities and connecting them with prevention initiatives such as:

- [State health department collaboratives](#)
- [Comprehensive Unit-based Safety Program \(CUSP\)](#)
- [Partnership for Patients](#)
- [CMS Quality Improvement Organizations](#)

The reports offer unique perspectives on the potential improvements that can take place when we engage specific facilities. By moving these hospitals towards more prevention, we hope to see greater national reductions in HAI next year.

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What's CDC doing about high-SIR states?

CDC is taking a proactive approach with all states. We offer training and technical assistance to help states identify and assist healthcare facilities whose performance doesn't show effective prevention work. We encourage states to monitor SIR so they can aid prevention efforts in problems areas and measure the effects of prevention work over time.

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What does it mean when states validate their data?

CDC encourages healthcare facilities and states to validate (double-check) the infection data they submit to NHSN. Validating data usually involves completing an assessment to ensure that all relevant infections were captured in the system.

Currently, different states use different systems to validate data. For example, some states only double-check the data from one facility while other states double-check more widely. CDC is working with states to determine best practices and develop effective validation standards.

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Will states that look harder for infections have higher SIR?

States that validate data and use other advanced tools for detecting HAI are likely to discover and report more infections than states that don't use such tools. The reports indicate which states are validating data, so those efforts can be taken into account when the state's performance is evaluated.

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