



# SEMMELWEIS TIMES

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## ZIKA - The new buzz word

The Kansas Department of Health and Environment (KDHE) received confirmation from the Centers for Disease Control and Prevention (CDC) of the first person in the state to test positive for Zika virus. The individual is an adult from southwest Kansas and has travel history to a country with local Zika virus transmission. The person subsequently developed any illness consistent with Zika virus infection and was tested per guidance from CDC and KDHE.

“Kansas is prepared for the Zika virus, and we are working with health care providers across the state to respond to both suspected and confirmed cases,” said Susan Mosier, MD, MBA, FACS, KDHE Secretary and State Health Officer. “I urge everyone who is considering travel to a country with Zika transmission to be aware of the situation and take precautions to protect themselves and prevent mosquito bites.” The list of affected areas includes many countries in the Caribbean and South and Central America. The list continues to change and can be found at: <http://www.cdc.gov/zika/geo/index.html>

Zika virus infection typically causes a mild illness in those who develop disease. Approximately 80 percent of those infected never show symptoms of the disease, with 20 percent showing mild symptoms. There is no vaccine to prevent infection and no specific antiviral treatment for Zika virus infection. The most common symptoms include fever, rash, joint pain and red eyes. The best way to prevent Zika virus is to prevent mosquito bites.

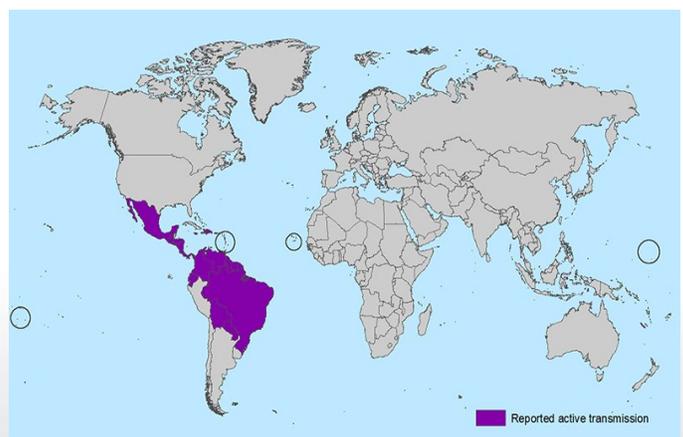


*Aedes aegypti* mosquito

When traveling to countries where Zika virus or other viruses spread by mosquitoes are found, take the following steps:

- Wear long-sleeved shirts and long pants
- Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside
- Sleep under a mosquito net if air conditioned or screened rooms are not available or if sleeping outdoors
- Use insect repellents containing an EPA-registered active ingredient on skin and clothing, including DEET, picaridin, oil of lemon eucalyptus, para-menthane-diol or IS 3535. If you are using sunscreen, apply sunscreen before applying insect repellent

## All Countries and Territories with Active Zika Virus Transmission



Source: Kansas Department of Health & Environment

## Pregnant Women and Zika Virus Infection

Pregnant women can be infected with Zika virus in any trimester and there have been increased cases of microcephaly possibly associated with Zika virus infections. Pregnant women should consider postponing travel to areas where Zika virus transmission is ongoing. Pregnant women who have recently traveled to an area with Zika virus should talk to a healthcare provider even if they don't feel sick. CDC and KDHE have guidance to help doctors decide what tests are needed for pregnant women who may have been exposed to Zika virus.

### Travel Notice

CDC has issued a travel notice (Level 2-Practice Enhanced Precautions) for people traveling to areas where Zika virus is spreading. For a current list of places with Zika outbreaks, see CDC's Travel Health Notices: <http://wwwnc.cdc.gov/travel/page/zika-travel-information>. This notice follows reports in Brazil of microcephaly and other poor pregnancy outcomes in babies of mothers who were infected with Zika.



### What We Know About Zika

- Zika can be passed from a mother to her fetus during pregnancy.
- Infection with Zika during pregnancy is linked to birth defects in babies.
- Zika is spread mostly by the bite of an infected *Aedes* species mosquito. These mosquitoes are aggressive daytime biters. They can also bite at night.
- There has been no local transmission of Zika in the continental US.
- There is no vaccine to prevent or medicine to treat Zika.
- Zika can be spread by a man to his sex partners

### Symptoms for Testing

- Pregnant women who experienced two or more of the these signs/symptoms should contact their healthcare provider: fever, maculopapular rash, arthralgia, or conjunctivitis within two weeks of travel to an area reporting Zika virus activity regardless of the length of time since the travel/illness occurred.

### Diagnostic Testing

During the first week after onset of symptoms, Zika virus disease can often be diagnosed by performing reverse transcriptase-polymerase chain reaction (RT-PCR) on serum. Virus-specific IgM and neutralizing antibodies typically develop toward the end of the first week of illness; cross-reaction with related flaviviruses (e.g., dengue and yellow fever viruses) is common and may be difficult to discern. Plaque-reduction neutralization testing can be performed to measure virus-specific neutralizing antibodies and discriminate between cross-reacting antibodies in primary flavivirus infections.



## CDC Issues Sex Precautions to Prevent Zika Transmission

The Centers for Disease Control and Prevention (CDC) has issued interim guidance on preventing sexual transmission of Zika virus. Sexual transmission of Zika virus is possible, and is of particular concern during pregnancy. In the known cases of probable sexual transmission, the men developed Zika symptoms, but the virus can be transmitted before, during, and after symptoms develop. "We know that semen may have large quantities of viable virus, for at least a period of time," said Dr Frieden. "The data on saliva and urine is less clear." Men who reside in or have traveled to an area of ongoing Zika virus transmission should consistently and correctly use condoms during sex (i.e., vaginal intercourse, anal intercourse, or fellatio). Men who have a pregnant partner may wish to abstain from sexual activity. Although sexual transmission of Zika virus infection is possible, mosquito bites remain the primary way that Zika virus is transmitted. Because there currently is no vaccine or treatment for Zika virus, the best way to avoid Zika virus infection is to prevent mosquito bites.

## CDC's NEWEST DATA TOOL: Antibiotic Resistance Patient Safety Atlas

[CDC's Antibiotic Resistance Patient Safety Atlas](#) provides open and interactive data about healthcare-associated infections (HAIs) caused by antibiotic resistant bacteria, which are reported to CDC through the [National Healthcare Safety Network](#) (NHSN). Atlas users can search and download the data displayed in the app to see patterns resistance for any of 31 bug-drug combinations, including pathogens identified by CDC as urgent or serious threats.

The atlas allows users to geospatially visualize national, regional, and state-level antibiotic resistance data from device and procedure related healthcare-associated infections (HAIs) commonly reported to the CDC's National Healthcare Safety Network (NHSN): central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), and surgical site infections (SSI). Thirty-one resistant phenotypes (bug-drug combinations) are presented, including methicillin-resistant *Staphylococcus aureus* (MRSA) and carbapenem-resistant Enterobacteriaceae (CRE). The main summary measure is the percent of bacteria causing the HAI that were resistant to a specific antibiotic (percent resistant). Caution is advised when comparing the percent resistant across states, territories, and Census regions, as HAI reporting requirements vary by state, as the percent resistance are not adjusted for patient-level factors like demographics or severity of illness (e.g. receiving care in an intensive care unit).

### **Interactive Maps and Customizable Data**

With the interactive maps and customizable data, you can customize maps and tables to show antibiotic resistance patterns in HAIs by filtering the data by geographical area (national, regional, and state), time period, event type, and patient age.

### **About the Data and Data Sources**

The AR Atlas includes 2011-2014 data reported to CDC's National Healthcare Safety Network. The data is from 4,403 facilities that reported at least one HAI to NHSN, including:

- 3,676 acute care hospitals
- 506 long-term acute care hospitals
- 221 inpatient rehabilitation facilities

*"Collection and analysis of data on antibiotic resistance is an important component of biosurveillance, the process of "gathering, integrating, interpreting, and communicating essential information related to all-hazards threats or disease activity affecting human, animal, or plant health to improve outbreak detection and support decision-making. Improved detection of resistant bacteria can be achieved through enhancements and expansion of existing surveillance systems that monitor resistance in healthcare settings such as the National Healthcare Safety Network [NHSN]. Experience with NHSN has shown that reporting also leads to better prevention, because hospitals and state and local health departments use NHSN data to guide local action to interrupt the spread of resistant infections".*

*National Strategy for Combating Antibiotic Resistant Bacteria*

### **What can you do**

As doctors, nurses, healthcare facility administrators, you must continue to do your part to prevent HAIs by combining three critical efforts;

- Get cultures, start the correct antibiotics promptly, and reassess 24-48 hours later. Use the appropriate antibiotic in proper dosage, frequency and durations. Know when to stop antibiotic treatment
- Stay aware of antibiotic resistance patterns in your facility, your community and your region
- Improve antibiotic use through stewardship
- Participate in and lead efforts within your hospital to improve prescribing practices
- Follow hand hygiene and other infection control measures with every patients

Explore the Atlas data. It can inform your efforts to stop HAIs and combat the threat of antibiotic resistance in your healthcare facility and community.

### **How to Get Started**

CDC has a step by step, Get Started Guide at:

<http://gis.cdc.gov/grasp/PSA/Download/ARPatientSafetyAtlas-NavigationGuide.pdf>

## A New Way to Fight Bacteria?

In bacteria, toxin-antitoxin systems consist of a set of two closely linked genes. Situated on the same chromosome, they encode both a protein "poison" and a counteracting "antidote." Under normal conditions, the antitoxin protein binds the toxin protein and prevents it from acting. But in response to environmental stress, the antitoxin proteins are broken down, which allows the toxins to poison the cells. Microbiologists at the University of Geneva (UNIGE), Switzerland, studied the toxin-antitoxin system HigBA, which can be found in many pathogenic and non-pathogenic bacteria, and found a novel regulatory mechanism. When acting on the toxin, this mechanism works like a "suicide button" that kills the cell. This discovery could open the door to potential new treatments of bacterial infections. The results were published in *Nature Microbiology*.

Patrick Viollier and his team from the UNIGE Faculty of Medicine have been studying the bacterium *Caulobacter crescentus*, and have singled out the toxin-antitoxin system HigBA. Today, they are able to explain why this particular toxin-antitoxin system may be a powerful weapon against bacterial infections. "Normally, toxin activation puts the cells into hibernation by shutting down their basic functions, allowing them to reactivate later on", explains Clare Kirkpatrick, first author of this study. "HigBA, on the contrary, is highly specific both in its activation conditions and its response. It is dedicated exclusively to the DNA damage response in these bacteria and attacks a small set of essential targets in the cell, leading to inescapable cell death."

Typically, the antitoxin is the only transcription factor that regulates toxin and antitoxin expression. The HigBA system, however, is also regulated by a DNA damage-responsive transcription factor, capable of much more strict repression than the antitoxin. This regulation is what permits the mutation of the antitoxin gene since it is still repressed by the other transcription factor, at least when there is no DNA damage: instead of responding to general stress, it only responds to DNA damage stress. "Unexpectedly, we found that HigBA acts like a highly specific «suicide button» for when the bacteria are suffering from DNA damage, such as can be caused by antibiotics," adds Kirkpatrick.

HigBA toxin-antitoxin system can be found in many bacteria. This very specific mechanism is most probably wide-spread, too. Knowing this, strategies to activate or block the toxin can be imagined. "Our discovery can change the way we fight bacterial infection. Instead of using chemical warfare, i.e. antibiotic unspecifically, we could force bacteria to turn their weapons on themselves by treating bacteria with selected combinations of antibiotics," adds Viollier.

Source: University de Genève - ICT Infection Control Today



**Location**



**Location**



**Location**

Location is a primary tenant in real estate, but who knew it could dramatically impact hand hygiene compliance? Researchers from Clemson University and the Greenville Health System in Greenville, S.C. conducted a three-week observational study at Greenville Memorial Hospital, in which they observed the alcohol-based hand sanitizers (AHS) use of more than 6,600 visitors. Placing alcohol-based hand sanitizers (AHS) in the middle of a hospital lobby floor in front of the visitor entrance increased visitor usage by 528 percent, according to a study published in the March issue of the *American Journal of Infection Control*. Additionally, the study found that children and young adults visiting the hospital were nearly 50 percent more likely to use alcohol-based hand sanitizer than older adults. Those in groups, versus visitors who entered the hospital alone, were almost 40 percent more likely to clean their hands with the product. "Visitors represent an additional vector by which healthcare-associated diseases can be transmitted to patients, and thus visitor hand hygiene is an opportunity to further improve patient safety," the study authors commented. "The study suggests many future research opportunities, including investigation into the effect of group dynamics and social pressure on visitor hand sanitizer utilization to identify strategies for improving visitor hand hygiene."

Source: Elsevier Health Sciences, ICT Infection Control Today

## A Nudge in the Right Direction: Behavior Modification Might Curb Antibiotic Overprescribing

Over prescription of antibiotics has contributed to the appearance of treatment-resistant infections. According to the study, published February 2016, in JAMA, there are more than 22 million inappropriate prescriptions in the U.S. every year for acute respiratory infections, such as the common cold.

"Until now, most efforts to reduce antibiotic prescribing have involved education, reminders or giving financial incentives to physicians," said principal investigator and senior author Jason Doctor, director of health informatics for the USC Schaeffer Center for Health Policy and Economics. "We decided to test if socially motivated interventions, such as instilling pride in their performance or making physicians accountable for their decisions, would help address the problem. Our findings here suggest they may." The study gave the clinicians one or more of three behavioral "nudges."

The researchers studied 248 clinicians – doctors, physician assistance and nurse practitioners – at 49 primary care practices in Massachusetts and Southern California (AltaMed Medical Group and The Children's Clinic, which also sees a large number of adult patients). The study focused on how these providers handled acute respiratory infections that should not be treated with antibiotics. After an 18-month control period, the researchers tracked the clinicians' prescribing decisions for more than 30,000 patients over another 18 months.

**The most successful** "nudge" involved "accountable justification," according to the study. When a provider would order antibiotics, a prompt would appear on the patient's electronic chart asking the clinician to justify the prescription. The justification would be added to the chart unless the provider cancelled the order.

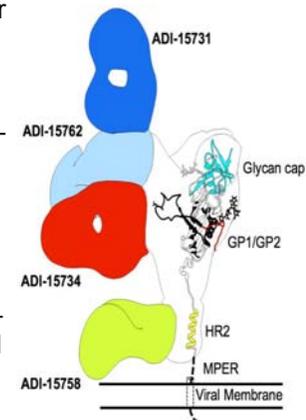
**The second-most successful** approach was "peer comparison." Clinicians received an email showing how they ranked in comparison with their counterparts' prescribing records. Those with the lowest rates of unnecessary prescriptions were rated "top performers" and were told "congratulations." Those who did not score well were rated "not a top performer" and received a count of their inappropriate prescriptions. Those two interventions together prevented on average one inappropriate prescription for every eight patients seen, the study concluded.

**Another "nudge"** suggested alternative treatments. When a provider ordered an unnecessary antibiotic for an acute respiratory infection, a box would appear on his computer suggesting alternative treatments. This approach also led to a reduction in inappropriate prescriptions, but the study concluded that the decrease was not statistically significant. "There was much more variability" in the data from the approach using suggested alternatives, "so we were not as confident in that result as we were with the other interventions," Jason Doctor told KPCC.

"The results of these simple interventions are promising. Over the 18 month intervention, inappropriate prescribing decreased from 22% to 6% with suggested alternatives, 23% to 5% with accountable justification and 20% to 4% with peer comparison", commented Jeffrey Gerber, MD,PHD., infectious diseases division at Children's Hospital of Philadelphia, "Changing clinician behavior is challenging. Factors other than specific medical need drive prescribing behavior. These include perceived patient or parent pressure, the presence of trainees, race of patient, and even the time of day. In the acute care setting, including in the ambulatory setting, behavioral determinants and social norms clearly influence antibiotic prescribing. For example, a simple "behavioral nudge" in the form of a signed commitment letter posted in the patient room was associated with a 20% reduction in inappropriate prescribing for viral acute respiratory tract infections".

## Researchers Discover New Ebola Fighting Antibodies in Blood of Outbreak Survivor

A research team that included scientists from the Scripps Research Institute (TSRI) has identified a new group of powerful antibodies to fight Ebola virus. The antibodies, isolated from the blood of a survivor of the 2014 Ebola outbreak and the largest panel reported to date, could guide the development of a vaccine or therapeutic against Ebola. The new study also revealed a previously unknown site of vulnerability in the structure of the deadly virus. "Within weeks of receiving a blood sample from a survivor of the 2014 Ebola outbreak, we were able to isolate and characterize over 300 monoclonal antibodies that reacted with the Ebola virus surface glycoprotein," says team leader Laura Walker, senior scientist at Adimab, LLC. Studies at TSRI and other institutions have shown that Ebola virus has several weak points in its structure where antibodies can target and neutralize the virus. However, the immune system typically needs a long period of trial and error to produce the right antibodies against these sites, so researchers have been working with only a small library of anti-Ebola options. Despite this limited library, researchers have had some success in designing antibody "cocktails" that target several weak points at once. One treatment in development, Mapp Biopharmaceutical Inc.'s ZMapp™, is a cocktail of three mouse antibodies modified to resemble human antibodies. This treatment was successful in primate trials and used as an experimental human treatment in the 2014 outbreak. "These types of antibodies could be developed into different types of antibody cocktails or therapeutics, in addition to advancing vaccine design," says Ward. The new study took advantage of a recently launched single B cell isolation platform from Adimab, which researchers used to quickly find more than 300 antibodies that reacted with the Ebola virus surface glycoprotein—the viral structure that fuses with host cells.



This image shows a key Ebola virus protein and vulnerable sites where antibodies (in color) can bind and neutralize it. (Image by Hannah Turner and Daniel Murin, courtesy of The Scripps Research Institute. [High-res image](#))

Remarkably, 77 percent of the antibodies in the new study showed the potential to neutralize Ebola virus, and several antibodies demonstrated significant protection against the virus in mouse models. "We identified three highly protective antibodies that each targeted a different site—or epitope—on the Ebola virus glycoprotein," Bornholdt says, assistant professor in the Ollmann Sapphire lab. Because these are human antibodies, not modified mouse antibodies, researchers potentially could quickly use them to design a treatment. Furthermore, with these new antibodies available, researchers might be able to design secondary treatments in case the Ebola virus mutates to escape other treatments.

Source: The Scripps Research Institute - Journal Science

## Fewer than 1 in 5 Nurses Comply with Standard Precautions

Only 17.4 percent of ambulatory care nurses reported compliance in all nine standard precautions for infection prevention, according to a [study](#) published in the January issue of the American Journal of Infection Control, the official publication of the Association for Professionals in Infection Control and Epidemiology (APIC). Researchers from Northwell Health (formerly North Shore Long Island Jewish Health System) conducted the study. Of 116 ambulatory care nurses to measure self-reported compliance with standard precautions, knowledge of hepatitis C virus (HCV), and behavioral factors influencing compliance. The response rate was 50% and the nurses represented oncology, dialysis, medicine, urology, surgery, and cardiology.

In this study fewer than one-fifth (17.4%) of nurses reported that they are "always compliant" with all 9 SP behaviors, 92% reported always wearing gloves, and 70% reported always using a face mask. More than 16% of respondents in this study reported that they sometimes or seldom avoid placing foreign objects on their hands.

Understanding reasons for noncompliance will help determine a strategy for improving behavior and programs that target the aspects that were less than satisfactory to improve overall compliance. It is critical to examine factors that influence compliance to encourage those that will lead to total compliance and eliminate those that prevent it. The results of this study reveal that rings and artificial fingernails need to be addressed and stricter enforcement of policy must take place so that nurse managers, educators, and infection control staff can develop educational and monitoring programs aimed at problem areas to increase the use of all SP behaviors.

Source: American Journal of Infection Control - January 2016

## Spring Break Means TRAVEL

U.S. air travel for this year's spring break season is expected to jump 3% over last year's, setting a new record, according to a trade group for the nation's airlines. The expected surge -- a rise to 140 million passengers during March and April, up from 136.2 million during the same months last year -- was attributed to "accessibility and affordability of air travel" by John Heimlich, chief economist for the trade group Airlines for America.

Assessing a patient's travel history is a critical step to understanding how to best address a patient's chief concerns and health issues. An active dialogue between patients and clinicians to accurately assess travel experiences and exposures can be vital to the understanding of many conditions. Diseases occurring at any given time in geographic locations around the world vary greatly and are continuously changing, so keeping up to date with disease trends and knowing where to look for information can be vital. The KDHE's [Think Travel History](#) Website, CDC's [Traveler's Health](#) and "[Yellow Book](#)" are great resources to turn to for the latest up to date [information](#).

Source: Hugo Martin - Los Angeles Times; March 2016 & KDHE

## App of the Day: HealthMap's Outbreaks Near You & Around the World

Kathleen S. Hall-Meyer, introduced a new app to those in attendance at the KHA Infection Prevention conference. [HealthMap](#), a team of researchers, epidemiologists and software developers at Boston Children's Hospital founded in 2006, is an established global leader in utilizing online informal sources for disease outbreak monitoring and real-time surveillance of emerging public health threats. The freely available Web site [healthmap.org](#) and mobile app [Outbreaks Near Me](#) deliver real-time intelligence on a broad range of emerging infectious diseases for a diverse audience. HealthMap brings together disparate data sources, including online news aggregators, eyewitness reports, expert-curated discussions and validated official reports, to achieve a unified and comprehensive view of the current global state of infectious diseases and their effect on human and animal health. Through an automated process, updating 24/7/365, the system monitors, organizes, integrates, filters, visualizes and disseminates online information about emerging diseases, facilitating early detection of global public health threats. HealthMap's content is aggregated from freely available information from the following sources:

[ProMED Mail](#)

[EuroSurveillance](#)

[Wildlife Data Integration Network](#)

[OIE - World Organization for Animal Health](#)

[World Health Organization](#)

[Google News](#)

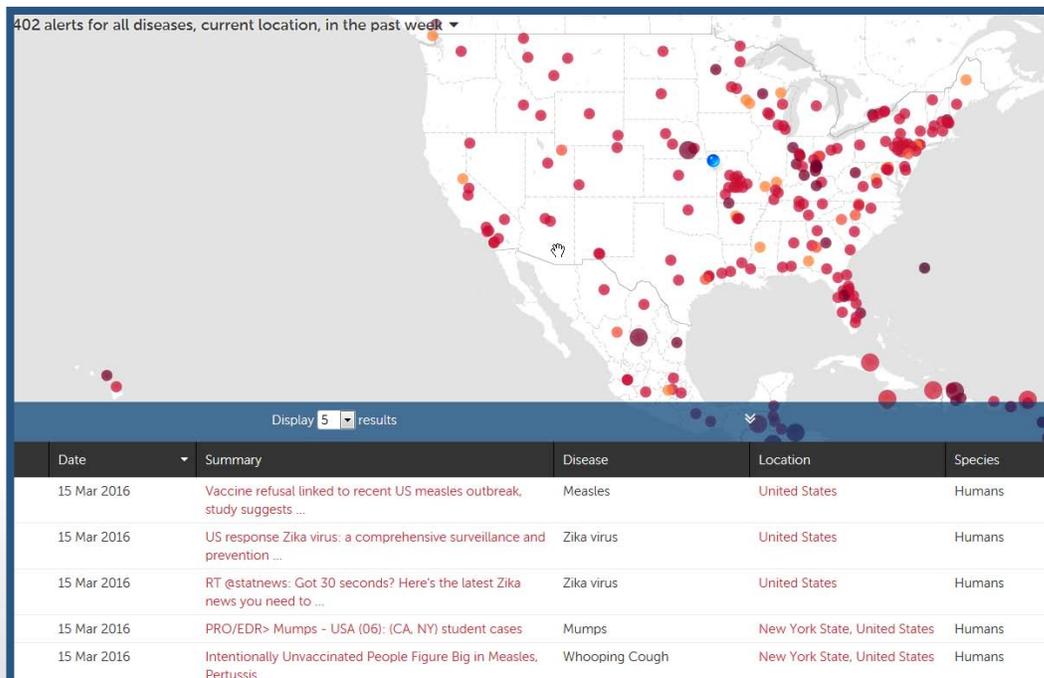
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Source: Kathleen S. Hall-Meyer, RN, MBA, CIC - Saint Luke's Health System and HealthMap

## CDC Healthcare Associated Infections Progress Report Released

The updated report details progress toward the ultimate goal of eliminating HAIs. The HAI Progress Report consists of national and state-by-state summaries of healthcare-associated infections. Infection data in this report includes central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), select surgical site infections (SSI), hospital-onset *Clostridium difficile* (*C. difficile*) infections, and hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia (bloodstream infections). Detailed data points can be found in the report's Data Tables.

This report, includes 2014 data, that describes significant reductions reported at the national level in 2014 for nearly all infections when compared to the baseline data. CLABSI and abdominal hysterectomy SSI show the greatest reduction. CLABSI and abdominal hysterectomy SSI show the greatest reduction. Some progress is shown in reducing hospital-onset MRSA bacteremia and hospital-onset *C. difficile* infections. The previous two reports showed an increase in CAUTI from the prior year, signaling a strong need for additional prevention efforts. CAUTI did decrease from 2013 to 2014, but continued prevention efforts are essential to improve patient safety.

### Among national acute care hospitals, the report found:

- 50 percent decrease in CLABSI between 2008 and 2014
- No change in overall CAUTI between 2009 and 2014

*However, there was progress in non-ICU settings between 2009 and 2014, progress in all settings between 2013 and 2014, and even more progress in all settings towards the end of 2014*

- 17 percent decrease in SSI related to the 10 select procedures tracked in previous reports
  - ⇒ 17 percent decrease in abdominal hysterectomy SSI between 2008 and 2014
  - ⇒ 2 percent decrease in colon surgery SSI between 2008 and 2014
- 8 percent decrease in *C. difficile* infections between 2011 and 2014
- 13 percent decrease in MRSA bacteremia between 2011 and 2014

### HAI in long-term acute care hospitals and inpatient rehabilitation facilities:

- LTACHs: 9 percent decrease in CLABSI and an 11 percent decrease in CAUTI between 2013 and 2014
- IRFs: 14 percent decrease in CAUTI between 2013 and 2014

CDC's [National Healthcare Safety Network \(NHSN\)](#) provided data for this report. The report helps measure progress toward the five-year HAI prevention goals outlined in the *National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination (HAI Action Plan)* set in 2009 by the U.S. Department of Health and Human Services (HHS). Progress is measured using the [standardized infection ratio \(SIR\)](#), a summary statistic used to track HAI prevention progress over time.

This report shows facilities taking the task of eliminating HAIs seriously. This is a great first step to reaching that goal. However, stay vigilant and continue working in that directions. Can't afford to relax your practices. The report can be found here: <http://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf>

Source: CDC Center for Disease Control and Prevention

### Contact Information

If you have comments, questions, have suggestions for articles, or would like to contribute an article for this newsletter, please contact:

**Joseph Scaletta, MPH, BSN, RN, CIC**  
**Program Director, Healthcare Associated Infections Program**  
[jscaletta@kdheks.gov](mailto:jscaletta@kdheks.gov)

D. Charles Hunt, MPH,  
 State Epidemiologist  
 & Director, BEPHI

Curtis State Office Building  
 1000 SW Jackson St  
 Topeka, Kansas 66612

Lou Saadi, Ph.D.  
 Deputy Director  
 State Registrar

Robert Geist, MPH, CIC  
 Epidemiologist, Healthcare Associated Infections Program

Karen Crawford, Infection Prevention Cord.  
 Healthcare Associated Infections Program