

Resistance, Regulations, Reporting and Resources: HAI Prevention in the Year 2008

**APIC-San Diego and Imperial Counties Chapters
State of Surveillance: Challenges in Infection
Prevention
Temecula, California
October 10, 2008**

**William R. Jarvis, M.D.
President, Jason and Jarvis Associates
WRJMJ@aol.com
www.jasonandjarvis.com**

Purpose

- **Provide an overview of healthcare-associated infections (HAIs).**
- **Discuss the impact and prevention/control measures for MRSA.**
- **Discuss the public movement for HAI prevention.**
- **Describe the role of leadership/hospital administrators in HAI prevention.**

CDC Estimate of the Burden of Healthcare-Associated Infections in the United States, 2002

- **1.7 million infections in hospitals**
 - Most (1.3 million) were outside of ICUs
 - 9.3 infections per 1,000 patient-days
 - 4.5 per 100 admissions
- **99,000 deaths associated with infections**
 - 36,000 – pneumonia
 - 31,000 – bloodstream infections

Number of Deaths for Leading Causes of Death, United States, 2005

- Heart disease: 652,091
- Cancer: 559,312
- Stroke (cerebrovascular diseases): 143,579
- Chronic lower respiratory diseases: 130,933
- Accidents (unintentional injuries): 117,809
- Healthcare-associated infections: 99,000
- Diabetes: 75,119
- Alzheimer's disease: 71,599
- Influenza/Pneumonia: 63,001
- Nephritis, nephrotic syndrome, and nephrosis: 43,901
- Septicemia: 34,136

Estimated Annual Hospital Cost of HAIs, by Site of Infection

<u>Major Site of Infection</u>	<u>Total</u>	<u>Hospital Cost per Infection (2002\$)</u>	<u>Total Annual Hospital Cost (in millions \$)</u>
Surgical Site Infection (SSI) ^a	561,667	\$25,546	14,348
Bloodstream Infection (BSI) ^a	248,678	\$36,441	9,062
Ventilator-associated Pneumonia ^a	250,205	\$9,969	2,494
Urinary Tract Infection (UTI) ^a	290,485	\$1,006	292
Total	1,737,125	\$14,700	25,535

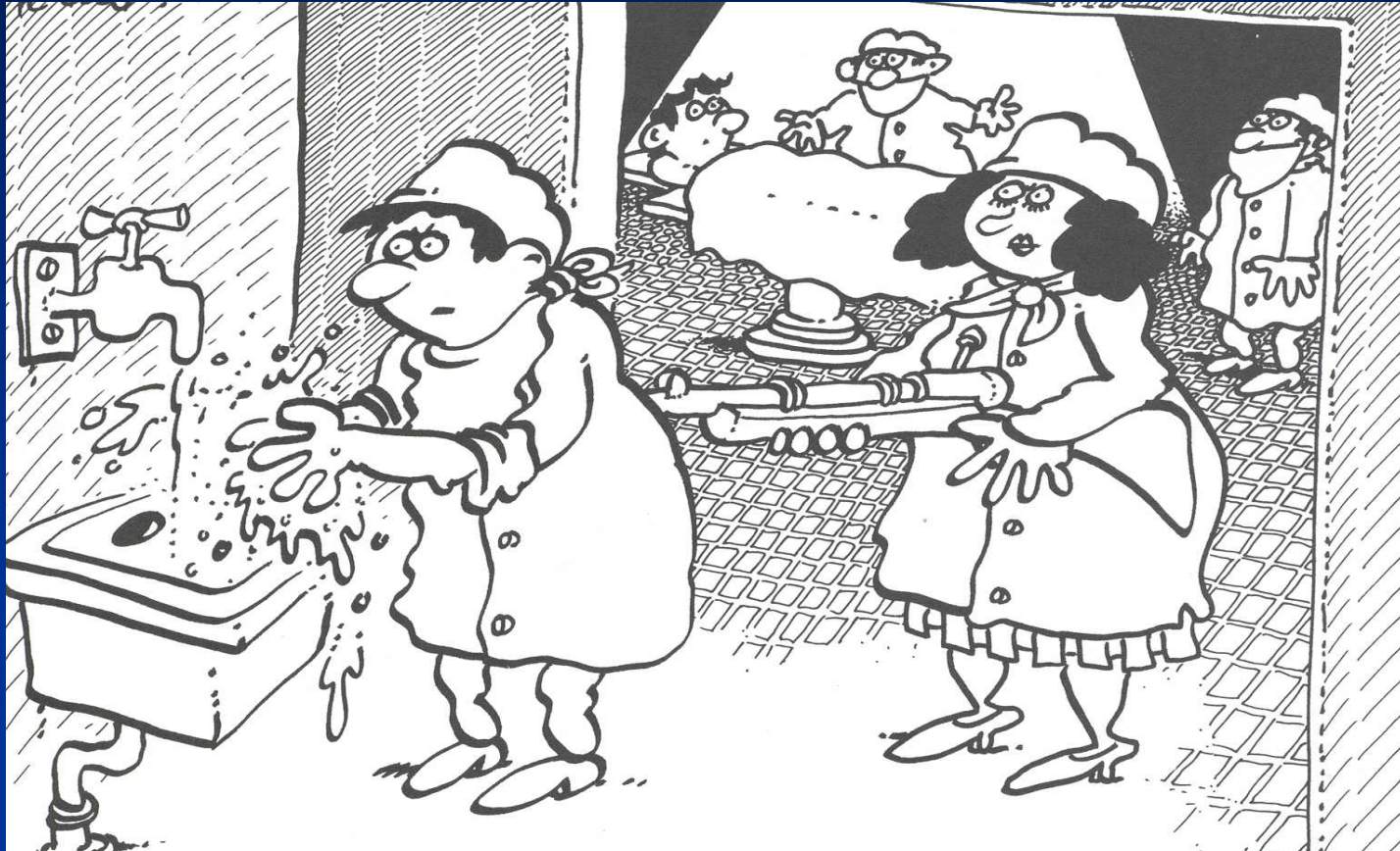
a) Stone PW, Braccia D, Larson E. Systematic review of economic analysis of health care-associated infections. *Am J Infect Control* 2005;33:501-9.

d) Roberts RR, Scott RD, Cordell R, Solomon SL, Steele L, Kampe LM, Trick WE, Weinstein RA. The use of economic modeling to determine the hospital costs associated with nosocomial infections. *Clin Infect Dis* 2003;36:1424-32.

Impact Of HAIs in California

- 4 million hospital admissions per year;
- At 6% HAI rate = 240,000 patients with HAIs annually;
- If estimated cost per HAI is \$14,700 = \$3.53 billion annually

We Know What to Do-----We just can't get clinicians to fully implement and continue to adhere to these various guidelines!



Methicillin-resistant *Staphylococcus aureus* (MRSA)

SUPERBUG 'TO KILL 150,000'



Minister orders his
health chief: Solve
deadly NHS crisis

URGENT action to combat the killer hospital bug MRSA was demanded last night by Health Secretary John Reid.

He acted as a leading expert warned the infection could kill 150,000 patients over the next two years.

Dr Reid asked the Chief Medical Officer, Sir Liam Donaldson, to bring forward publication of his report into the spread of MRSA "as a

EXCLUSIVE

By **Lucy Johnston**
and **Michael Knapp**

matter of urgency". The report is expected to heavily criticise hospital hygiene standards and call for a major shake-up in the way wards are cleaned.

The move comes as Professor Hugh Pennington,

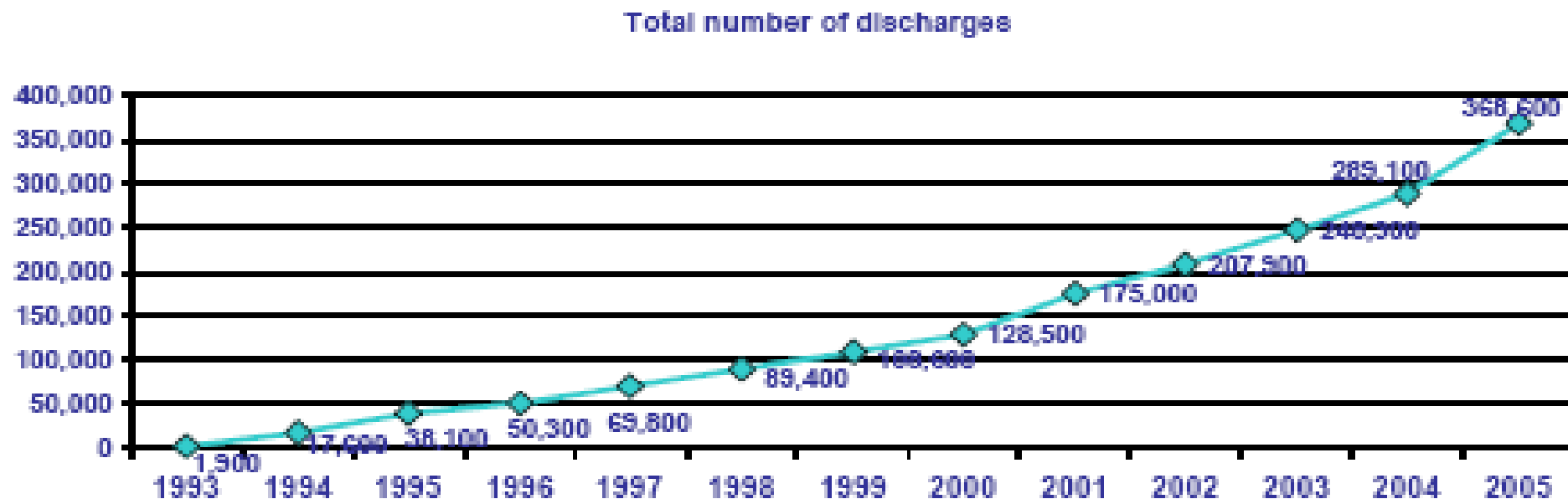
TURN TO PAGE 5

More Recent Estimate of The Number of MRSA Infections At U.S. Hospitals

- 125,969 hospitalizations with MRSA infection discharge diagnosis
 - 31,440 MRSA septicemias
 - 29,823 MRSA pneumonias
 - 64,706 other MRSA infections
- 3.95 MRSA infections per 1,000 hospital discharges



Figure 1. Hospital stays with methicillin-resistant Staphylococcus aureus (MRSA) infections, 1993–2005



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1993-2005

Invasive MRSA Infections, 2005- U.S. Population Standardized Rates

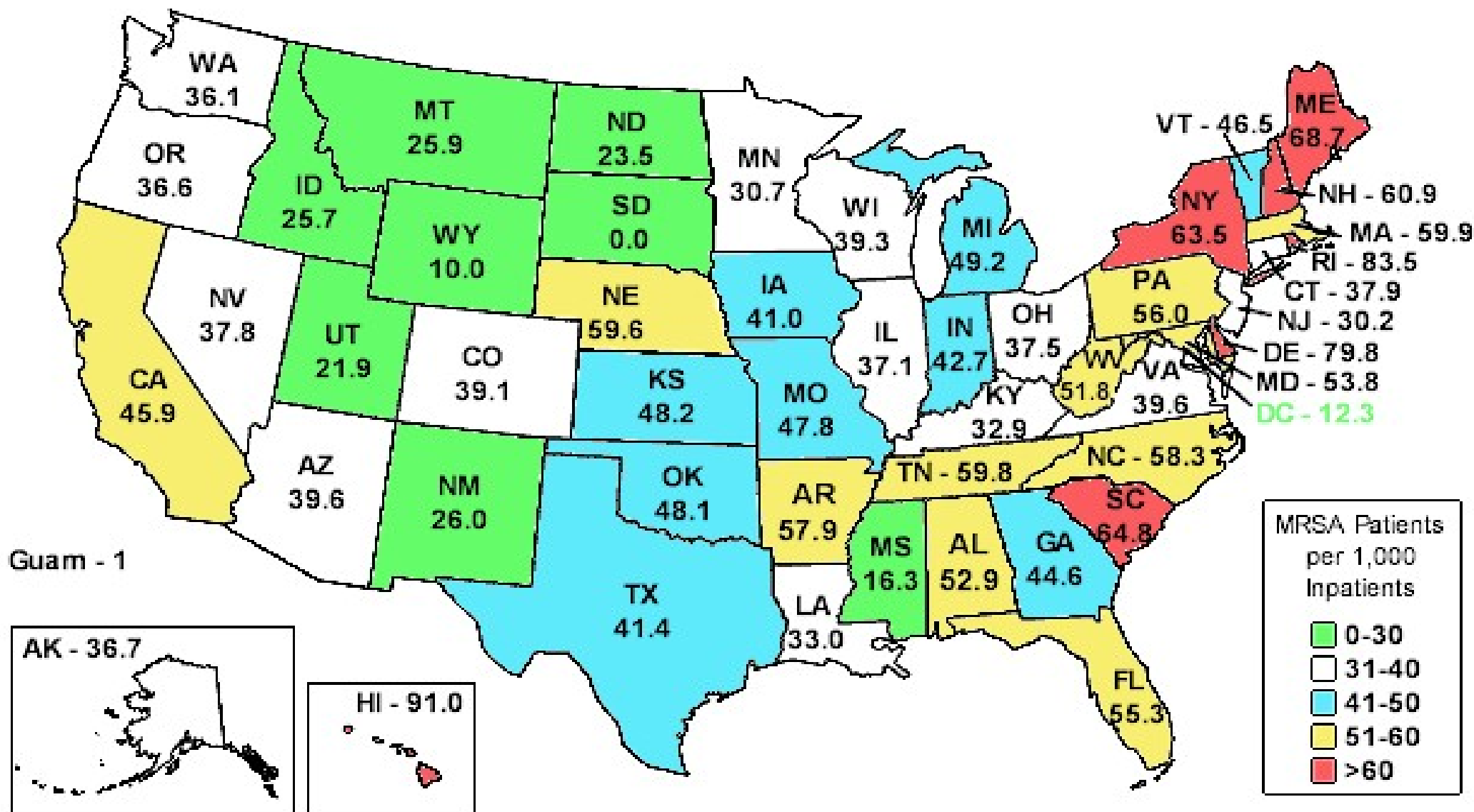
- 5,287 invasive MRSA infections in 2005.
- Standardized incidence rate: 31.8/100,000.
- Standardized mortality rate: 6.3 per 100,000 population.
 - HA-MRSA-hospital-onset: 2.5.
 - HA-MRSA-community-onset: 3.2.
 - Community-associated-MRSA: 0.5.
- When standardized for the U.S. population, it was estimated that in 2005:
 - 94,360 patients had invasive MRSA infections
 - 18,650 in-hospital deaths from invasive MRSA.

The APIC National MRSA Inpatient Survey Results

- 8,654 MRSA patients with colonization/infection.
- 187,058 inpatients
- Overall MRSA prevalence rate:
46.3 per 1,000 inpatients.

The APIC National MRSA Inpatient Survey

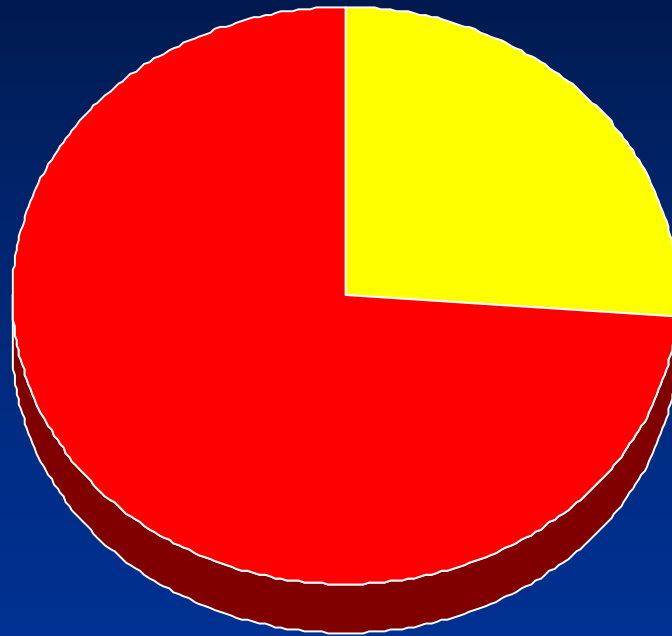
Results: MRSA Rates By State



The APIC National MRSA Inpatient Survey

Results: HA-MRSA vs. CA-MRSA

HA-MRSA
(74%)



CA-MRSA*
(26%)

*CA-MRSA = diagnosed <48 hours, skin/soft tissue infection, susceptible to clindamycin and Levofloxacin.

Why Even Consider Active Surveillance Testing?

Can't You Just Rely On Clinical Cultures To Detect MRSA-Patients?

- Muder et al. showed that in a VA Hospital Surgical Unit from November 2001-August 2002, when they performed AST (cultures) on all admitted patients, only 33/91 (**36%**) with MRSA-positive cultures would have been detected by clinical cultures. (Muder et al, ICHE 2008;June 19).
- Salgado et al. found that of 437 patients MRSA-colonized on hospital admission, only 66 (**15%**) had positive clinical cultures for MRSA during their hospital stay. (ICHE 2006;27:116-21).
- Muto et al found that only **26%** (118/459) of the 459 patients identified as MRSA-colonized via AST had a MRSA + clinical culture; $\frac{3}{4}$ of all patients would have been missed if AST were not in place. (Muto et al, SHEA Annual Meeting 2005).
- Robicsek et al. 24,045 admissions screened for MRSA. Clinical cultures would have detected **17.8%** of the MRSA-patients. (Robicsek A et al., Ann Intern Med 2008;6:409-18.)

MRSA Colonization Leads to Infection

- Nares cultures on all patients admitted to five units.
- 19% of those MRSA-colonized on admission and 25% of those acquiring MRSA in the hospital developed MRSA infections compared to 1.5% of those MSSA-colonized or 2% of those not colonized.
- **MRSA-colonization increased infection risk compared to MSSA-colonization (RR=9.5) or uncolonized (RR=12).**
- Identifying MRSA-colonized patients at admission may benefit from interventions to decrease infection.

Risk of MRSA Infection and Death in Long-term MRSA Carriers

- Study design: Follow-up of 281 prevalent (>1 yr) MRSA carriers.
- Results:
 - 65/281 developed 96 discrete and unrelated MRSA infections within 1 year.
 - Pneumonia 39%
 - Soft tissue 14%
 - CVC-infections 14%
 - BSI 24%
 - 38 MRSA infections occurred during new hospital admissions. 32 (84%) were the reason for the admission.
 - **14 deaths occurred; 22% of MRSA infections and 5% of colonized patients.**

Estimated Cost of MRSA Infections

- MRSA-BSI: Median attributable cost: \$27,083 (Abramson et al., ICHE 1999;20:408-11).
- MRSA-SSI: Excess cost per case: \$41,274 (vs. no infection) or \$13,901 (vs. MSSA) (Kaye et al., Emerg Inf Dis 10:1125-8, 2004).
- 1.36-fold increase in hospital *charges* for MRSA vs MSSA (Cosgrove et al., ICHE 2005;26:166-174).

**So MRSA infections are costing us
a lot of money now.**

So, How Much Are Current MRSA Infections Costing Us*?

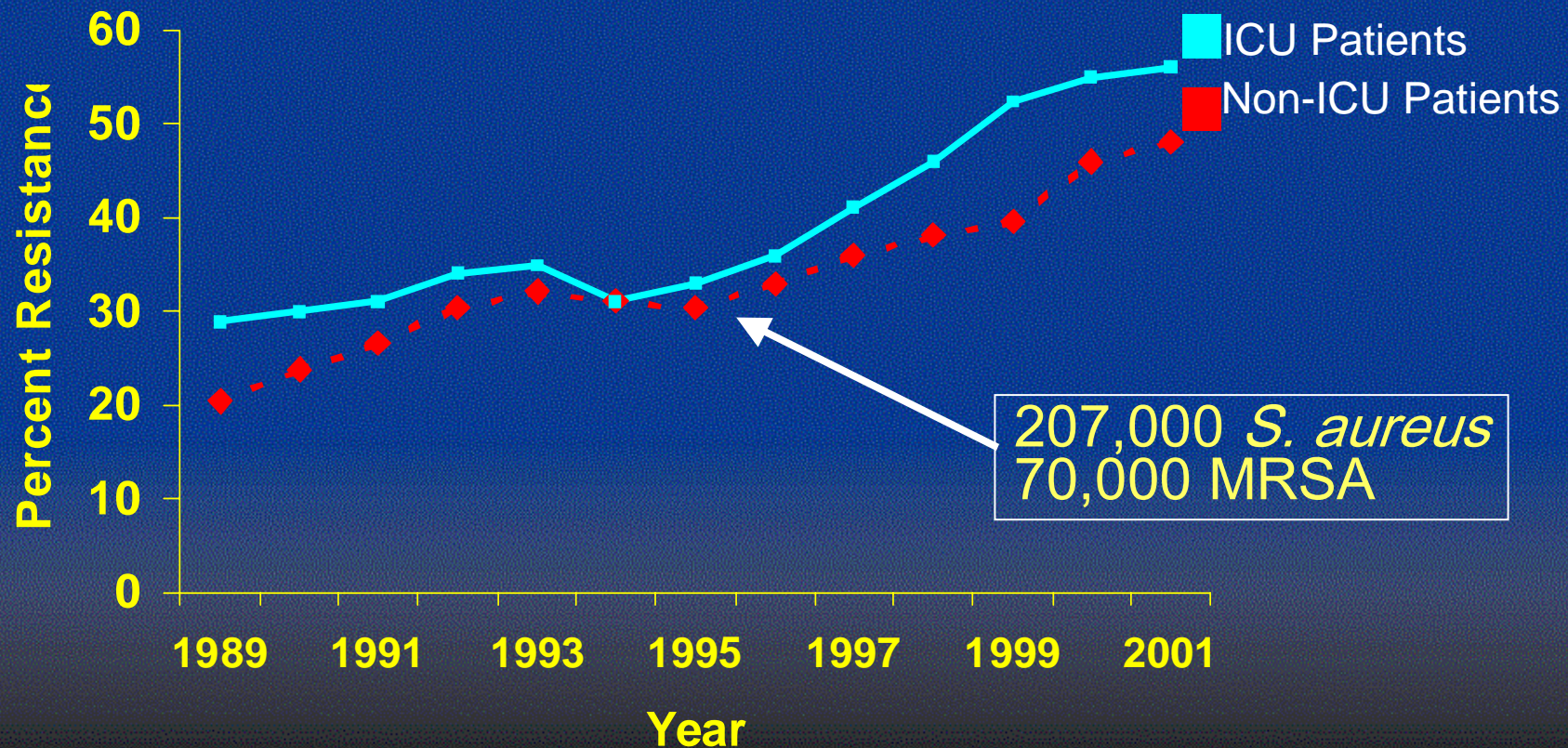
- Assume: 125,969 MRSA infections per year

<u>Ave. Days</u>	<u>Est. Days</u>	<u>Ave. Cost</u>	<u>Est. Cost</u>
5	629,845	\$5,000	\$628,480,000
10	1,259,690	\$15,000	\$1,885,440,000
15	1,889,535	\$25,000	\$3,142,400,000

*Does not include community onset MRSA or MRSA infections at non-acute care settings (or medicolegal costs).

**Why Is A More
Aggressive Approach to
Control of ARP
Necessary?**

Proportion of *S. aureus* Nosocomial Infections Resistant to Oxacillin (MRSA), by ICU Status, National Nosocomial Infections Surveillance (NNIS) System, 1989-2001



Adapted from Fridkin S, Clinics Chest Med: 2003;20:303-315

Rates of MRSA Transmission

	Source	
	Isolated	Unisolated
Transmissions	5	10
Patient-days	558	71.5
Rates	0.009	0.140

RR=15.6, 95% CI=5.3-45.6, p<0.0001

J Jernigan et al., Am J Epi 1996;143:496.

Current U.S. Guidelines for Control of MRSA in Healthcare Systems

- Centers for Disease Control and Prevention's (CDC) Multidrug-resistant Organism (2006) and Isolation (2007) Guidelines.
- Society for Healthcare Epidemiologists of America (SHEA) Guideline for Preventing Transmission of Multidrug-Resistant Strains of *Staphylococcus aureus* or Enterococcus in Healthcare Settings (2003).

SHEA Guideline for Preventing Transmission of Multidrug-Resistant Strains of *Staphylococcus aureus* or *Enterococcus* in Healthcare Settings

**Carlene A. Muto, MD, MS; John A. Jernigan, MD, MS;
Belinda E. Ostrowsky, MD, M.P.H.; Herve M. Richet, MD;
William R. Jarvis, MD; John M. Boyce, MD; William J.
Martone, MD; Barry M. Farr, MD, MSc**

ICHE 2003;24:362-386

SHEA Guideline Recommendations-Five Steps to Controlling Antibiotic Resistant Pathogens: Active Detection and Isolation (ADI)

- 1. Risk assessment to identify high risk patients.**
- 2. Active surveillance testing of identified high-risk populations to identify the reservoir for spread.**
- 3. Hand hygiene.**
- 4. Barrier precautions for patients known or suspected to be colonized or infected with epidemiologically important antimicrobial-resistant pathogens, such as MRSA or VRE.**
- 5. Antibiotic Stewardship.**
- 6. Decolonization or suppression of colonized patients.**

New CDC MDRO Guideline: A Two-Tiered Approach

- The First Tier:
 - The **baseline level of MDRO control activities** designed to ensure recognition of MDROs as a problem, involvement of healthcare administrators, and provision of safeguards for managing unidentified carriers of MDROs.
 - Basically, in acute care settings:
 - Monitor rates*
 - Contact isolation*--"for all patients known to be infected with targeted MDROs.
 - (Hand hygiene)
 - Environmental cleaning
- *Only Category 1A recommendations

CDC HICPAC Guideline on Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006

- When incidence or prevalence of MDROs ARE NOT DECREASING despite implementation of and correct adherence to the routine control measures described, intensify MDRO control efforts.

New CDC MDRO Guideline-Tier Two

- With the emergence of an MDRO problem that cannot be controlled with the basic set of infection control measures, additional control measures should be selected from the second tier of interventions.
 - Identification of an MDRO from even one patient in a facility or special unit with a highly vulnerable patient population (e.g., an ICU, NICU, burn unit) that had previously not encountered that MDRO.
 - **Failure to decrease the prevalence or incidence of a specific MDRO (e.g., incidence of resistant clinical isolates) despite infection control efforts to stop its transmission. IF YOUR MRSA INFECTION RATE IS NOT GOING DOWN—YOU MUST DO MORE!!!**

Three Year Trend in MRSA Rates: National Survey of 494 U.S. Hospitals

Pathogen	Increasing (% of hospitals)	Unchanged (% of hospitals)	Not Decreasing (% of hospitals)	Decreasing (% of hospitals)
MRSA	66%	30%	96%	4%

**So, if your MRSA rate is decreasing,
are in the minority!**

MRSA Prevention-Guideline Comparison

	<u>IHI</u>	<u>CDC</u>	<u>SHEA</u>	<u>APIC</u>
Guideline Title	5 Million Lives Campaign: Reduce MRSA Infections, December 2006	Management of MDROs in Healthcare Settings, November 2006	Guideline for Preventing Nosocomial Tx of Multidrug-Resistant Strains of <i>S. aureus</i> and Enterococcus, 2003	Implementation guide to best practices for the Elimination of MRSA Tx, March 2007
Active Surv Testing	<u>Essential Intervention Recommended</u>	<u>by all Guidelines</u>	<u>for prevention and control of</u>	<u>MRSA-associated infections</u>
When to conduct	Routinely; on admission; periodic/weekly sweeps of high-risk areas and high-risk patients	When MDRO rates are Not going down. Routinely; on admission; periodic/weekly sweeps of high-risk areas and high-risk pts. Monitor for trends	Routinely; on admission; periodic/weekly sweeps of high-risk areas and high-risk patients	Routinely; on admission; periodic/weekly sweeps of high-risk areas and high-risk patients

Adapted from document provided by Amber Hogan, BD; www.BD.com/HAls

MRSA Prevention-Guideline Comparison

	<u>IHI</u>	<u>CDC</u>	<u>SHEA</u>	<u>APIC</u>
AST of which patients?	<u>High-risk patients upon admission and weekly – each hospital to determine risk factors,</u>	<u>including:</u> <u>- prior history of MRSA - admission to ICU</u>	<u>recent hospitalization (< one year) – roommates of colonized or infected Persons</u>	<u>history or transfer from long-term care facility - skin wounds</u>
Which sites To test/ culture for MRSA?	Anterior nares will identify majority of colonized adults; adding wound cultures Increases sensitivity. Anterior nares and umbilicus for Newborns.	Anterior nares usually Sufficient. Obtain cultures from areas of skin breakdown and draining wounds.	Anterior vestibule of the nose –always; throat cultures can enhance sensitivity; Consider peri-rectal perineal, but never as only culture Site areas of skin breakdown.	Anterior nares Areas of skin breakdown and wounds.

Adapted from document provided by Amber Hogan, BD; www.BD.com/HAls

MRSA Prevention-Guideline Comparison

	<u>IHI</u>	<u>CDC</u>	<u>SHEA</u>	<u>APIC</u>
Contact precautions including hand hygiene	<u>Per CDC/HICPAC Guidelines.</u> Routinely For all patients known to Be colonized or infected with MRSA. If single rooms are not available For patient isolation, MRSA-colonized or infected patients can be cohorted together.	<u>Per CDC/HICPAC Guidelines</u>	<u>Per CDC/HICPAC Guidelines</u>	<u>Per CDC/HICPAC Guidelines</u>
Environmental measures including surface and equipment Decontam	<u>Essential</u>	<u>element</u>	<u>recommended</u>	<u>by all.</u>
Antibiotic stewardship	<u>Essential</u>	<u>element</u>	<u>recommended</u>	<u>by all.</u>

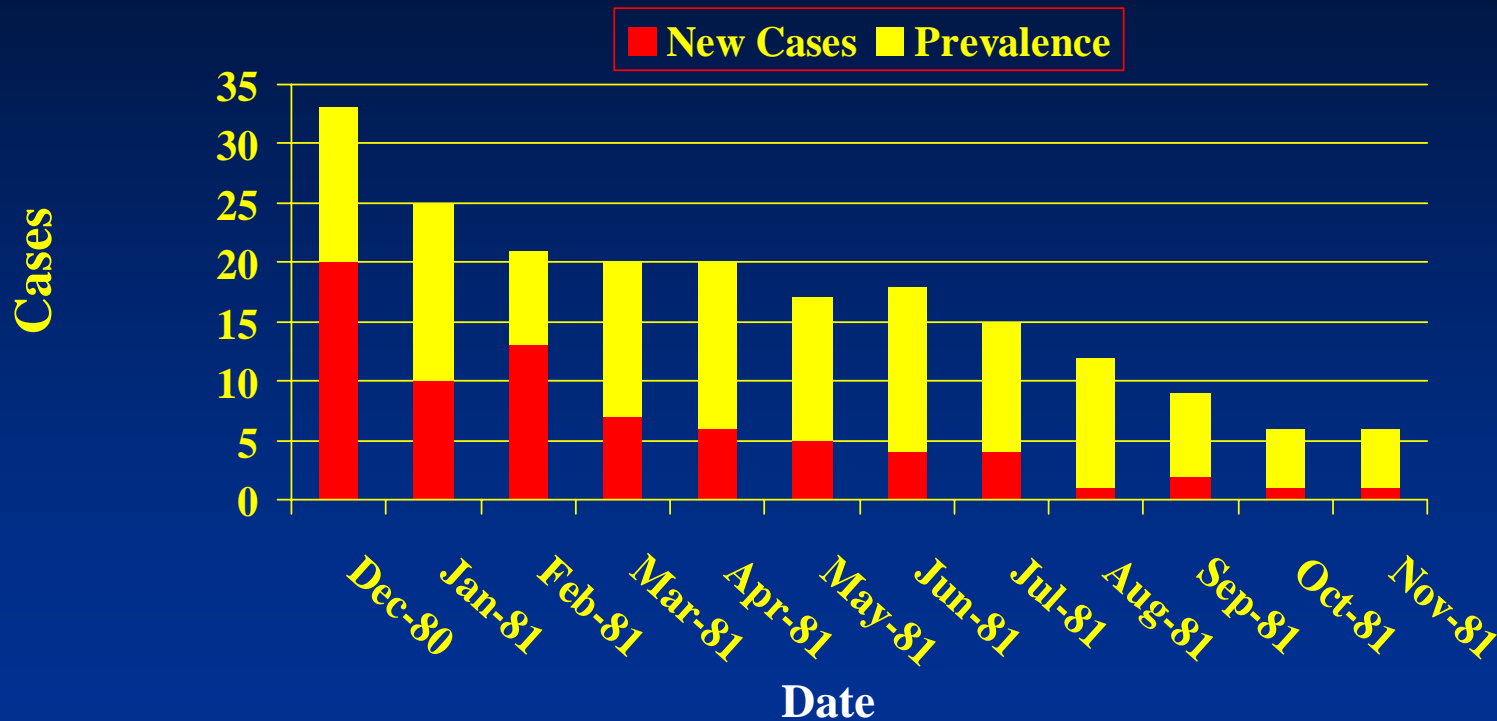
**Are There Data to Suggest That
This SHEA-Recommended
Approach Would Control
MRSA?**

Applying the Current CDC Recommendations: Failure To Prevent MRSA Spread

- **Thompson *et al.* found that despite isolation of patients known to have MRSA from clinical cultures, the prevalence of MRSA infection continued to increase.**

	1977	1979	1980
Pneumonia	0%	19%	24%
Blood stream infection	0%	13%	40%
Surgical site infection	0%	27%	49%

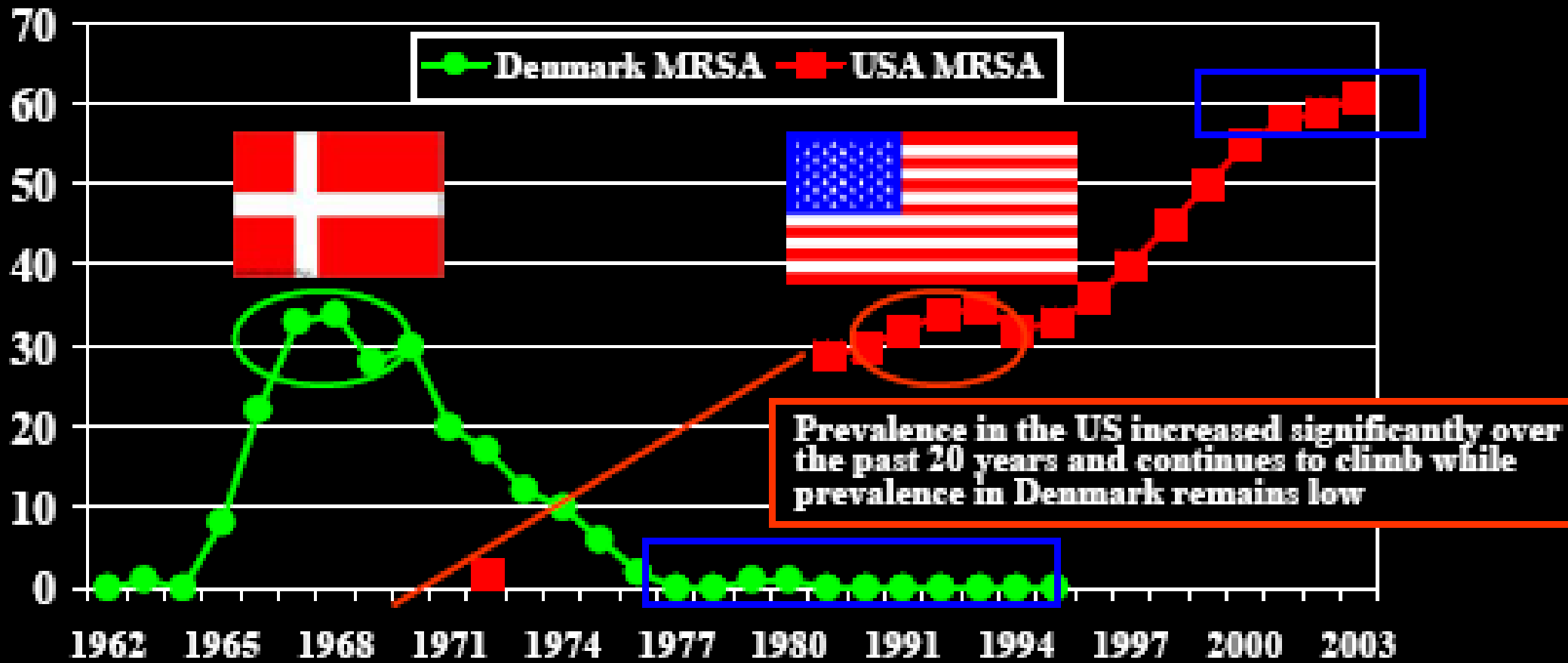
Control of MRSA Using Active Detection and Isolation (ADI) (including Active Surveillance Cultures and Contact Precautions [SHEA Guideline Approach]), University of Virginia



Incidence ($p < 0.002$) and Prevalence ($p < 0.001$)

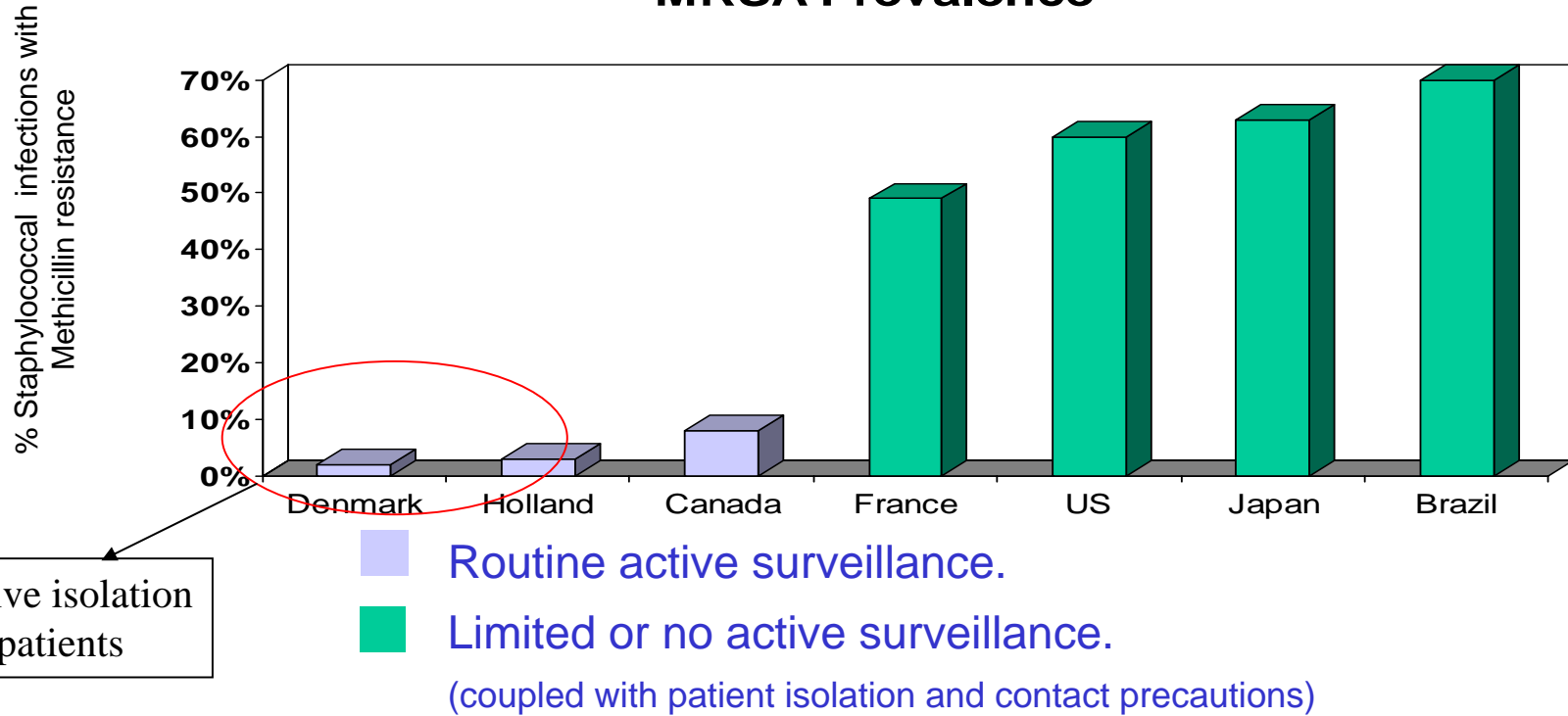
Thompson et al. Ann Intern Med 1982; 97:309-317

MRSA Infection Rates-Denmark and the United States, 1962-2003

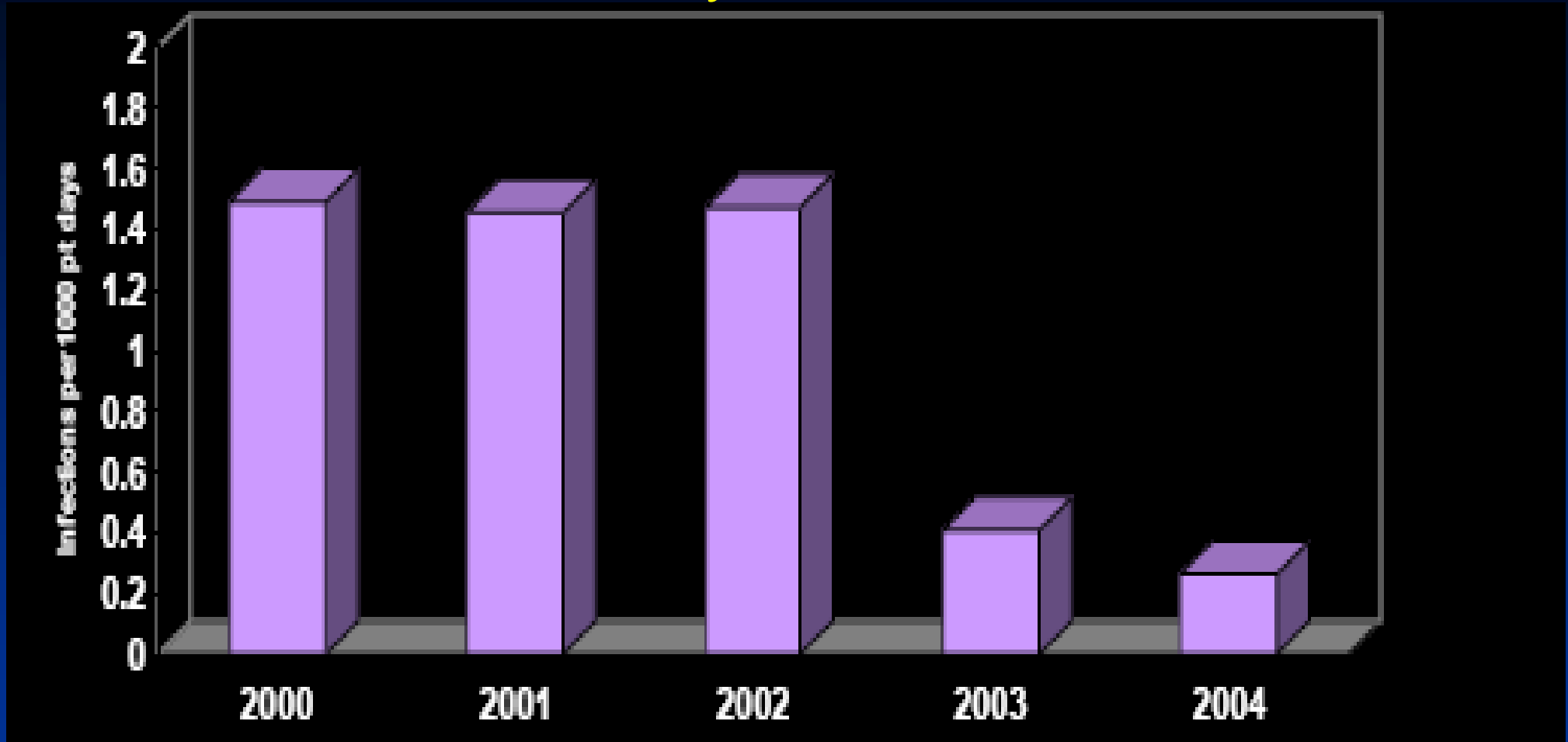


Impact of Active Detection and Isolation (ADI) for MRSA

MRSA Prevalence



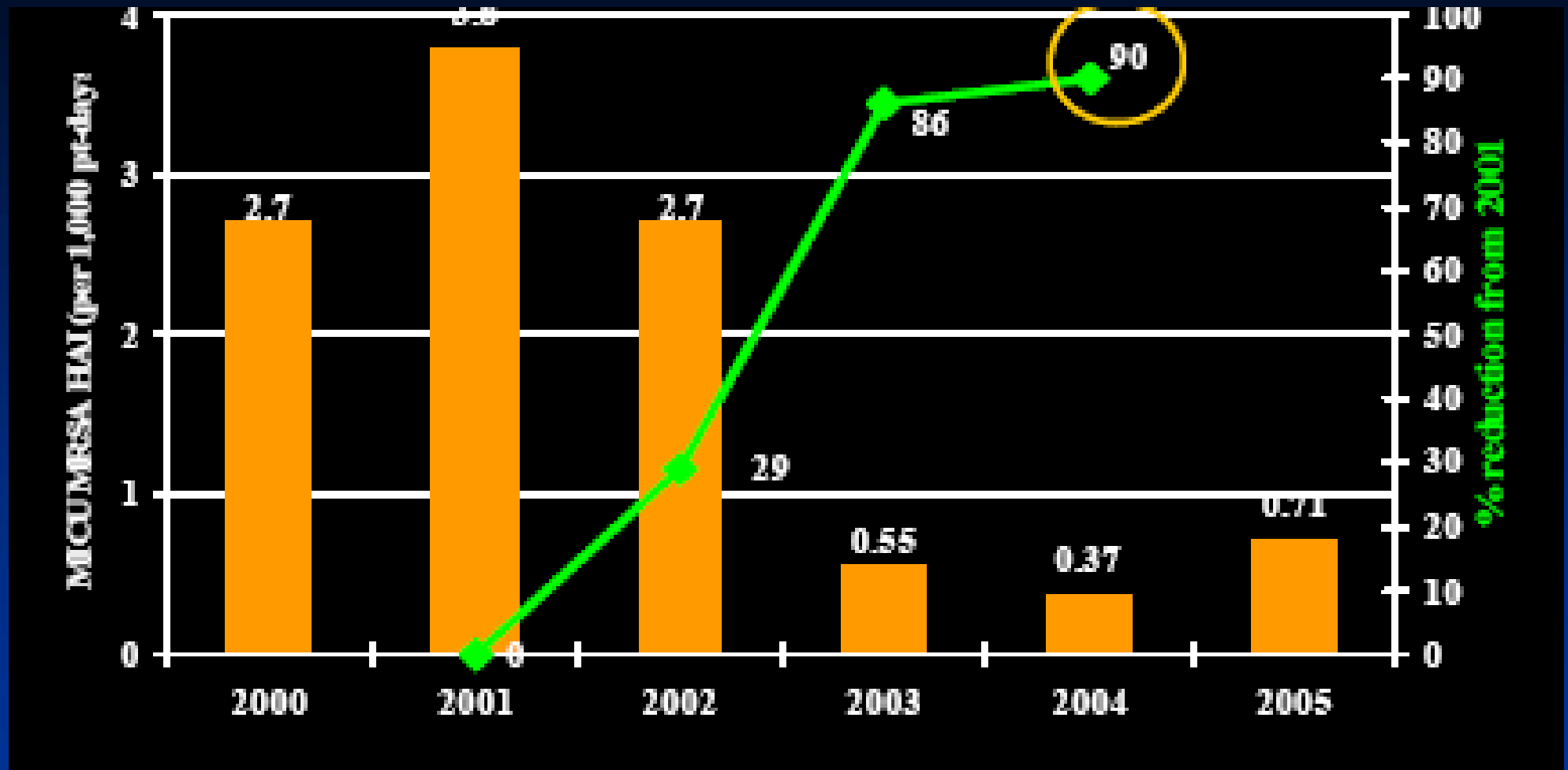
MRSA-HAI Rates, Surgical Unit, Pittsburgh VA, January 2000-2004



VA MRSA bundle was associated with a >80% (1.56 to 1.35 per 1,000 pt-days), reduction of MRSA infection rate on their surgical step-down unit.

Muder R et al. ICHE 2008;29:702-8.

MRSA-HAI Rates, MICU, University of Pittsburgh, 2000-2005



UPMC MRSA bundle was associated with a >90% reduction of the MRSA infection rate in their MICU (OR 10.4 95% CI 3-43, $p=4.6 \times 10^{-6}$)

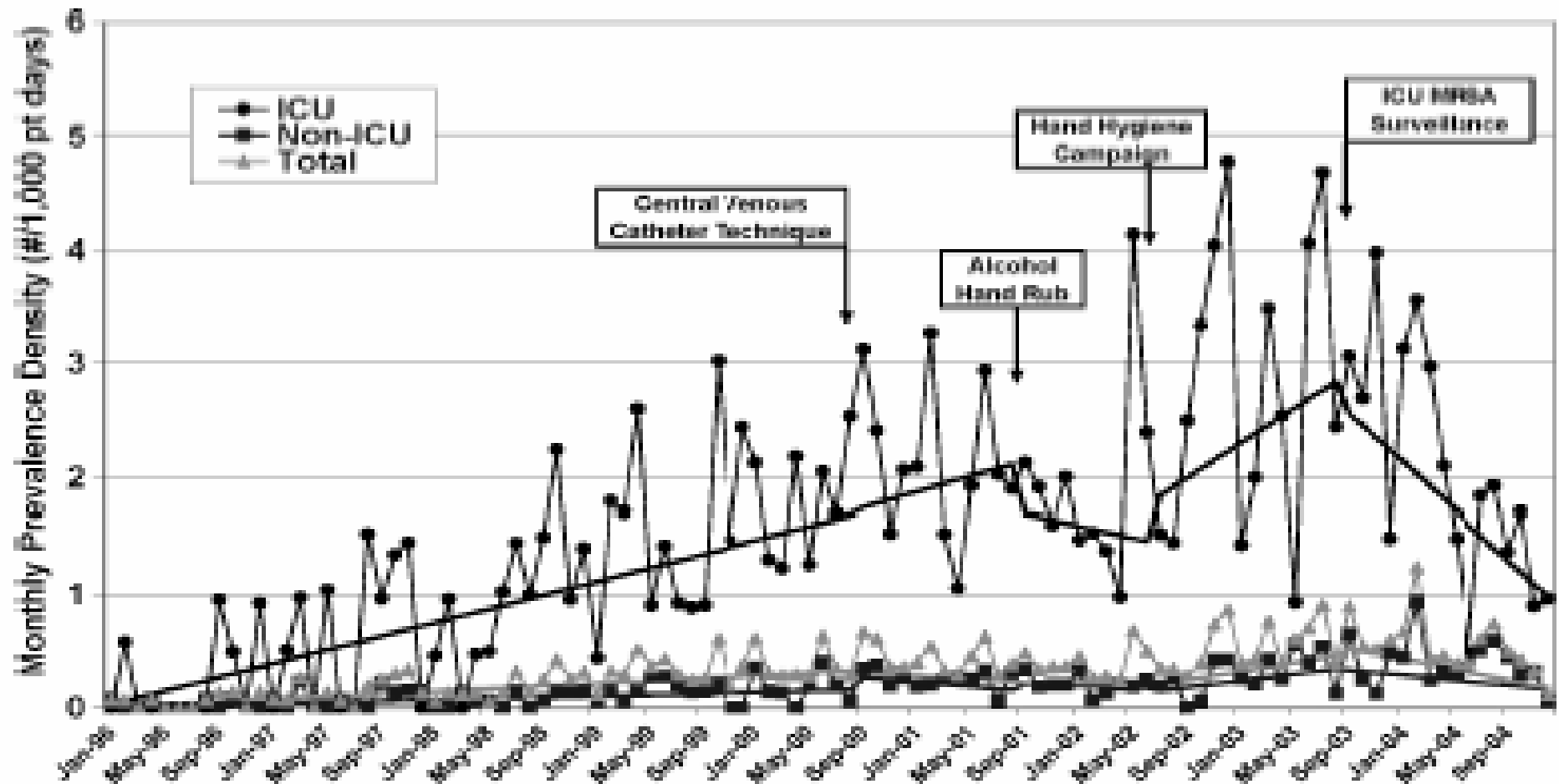
Muto et al. SHEA Annual Meeting, Los Angeles, CA 2005

Controlling Endemic MRSA

- **Study Design**: Retrospective study of 4 major infection control interventions—promoting compliance with: 1) maximum barrier precautions; 2) institution of alcohol-based hand rubs for hand disinfection; 3) hand hygiene campaign; and 4) institution of routine nares cultures for MRSA in all ICU patients on admission and weekly thereafter (+ cult contact isolation). Four years. Eight ICUs.
- **Analysis**: Interrupted time series.

Huang SS. et al. CID 2006:43:971-978

Reducing MRSA-BSI Rates



Impact of ICU Surveillance on Nosocomial MRSA Bacteria January 1996 – December 2004

75% reduction in MRSA bacteremia

Controlling Endemic MRSA

- **Results**: In 16 months of active surveillance cultures for MRSA, the incidence density of MRSA-BSI decreased by 75% in the ICUs (P=.007) and by 40% in non-ICUs (P=.008), leading to a 67% hospital-wide reduction in the incidence of MRSA-BSI (P=.002). MSSA rates remained stable. The other interventions were not associated with a statistically significant change in MRSA-BSIs.
- **Conclusion**: Routine surveillance for MRSA in ICUs allowed earlier initiation of contact isolation precautions and was associated with a large and statistically significant reduction in MRSA-BSI in the ICUs and hospital-wide. No similar decrease was attributable to the other infection control interventions—including hand hygiene and contact isolation.

CDC HICPAC Guideline on Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006

- When ASCs are obtained as part of an intensified MDRO control program, implement Contact Precautions until the surveillance culture is reported negative for the target MDRO (i.e., Pre-emptive isolation).

Modeling MRSA Transmission: Culture vs. PCR

- Predicts that establishing a MRSA culture-based admission screening & control program with an 80% compliance in performing admission surveillance cultures would lead to a 35% decrease in MRSA acquisition.
- Relative to this new baseline, introducing MRSA PCR-based screening would lead to an additional 37% decrease, given that patients are isolated only when test results turn positive.
- If the MRSA-PCR test, pre-emptive isolation, and increasing hand hygiene compliance by 10% were implemented simultaneously, the model predicts a decrease in nosocomial MRSA acquisition of >70%.

Controlling MRSA: Quantifying the effects of interventions and rapid diagnostic testing

- Simulation model showed:
- (i) strong causality between “Search & Destroy” and the low prevalence of MRSA in hospitals and community;
- (ii) that isolating MRSA-carriers identified by clinical cultures as a single infection control measure, although useful, is unlikely to be sufficient to eliminate or prevent endemicity;
- (iii) that a combined approach of screening high-risk patients upon admission plus the screening of contact patients when an index patient is identified is responsible for the success of “Search & Destroy”; and
- (iv) suggests that with full “Search & Destroy”, or one with a stepwise approach toward this policy, high nosocomial endemicity levels can be reduced to levels 1% within 6–12 years.

Sequential Screening of Surgical Patients May Not Reduce MRSA Infections

Study design:

- Prospective, interventional cohort crossover study in surgical patients from July 2004-May 2006, Switzerland.
- MRSA-PCR (home made) on nares/perineal region of patients admitted >24hrs before/on admission (not repeated).
If +: contact isolation, dedicated equipment (gowns, gloves, masks), decolonization (CHG, mupiricin for 5 days).
- Baseline (3m), Period 1 (9m)-5 surgical specialties, Washout (2m), Period 2 (9M) 3 surgical specialties.

Sequential Screening of Surgical Patients May Not Reduce MRSA Infections

Results: 10,193/10,844 (94%) screened. 515 (5.1%) MRSA+ (337 previously known).

<u>Period</u>	<u>No. MRSA Patients</u>	<u>MRSA Rate (per 1,000 pt-days)*</u>
Intervention	93	1.11
Control	76	0.91

*Difference in rate not statistically significant.

Conclusion: Rapid MRSA admission screening did not reduce nosocomial MRSA infections in surgical patients.

Why Did The Sequential Screening of Surgical Patients Not Reduce MRSA Infections?

First, MRSA rate at the hospital is relatively low to begin with.

Second, surgical patients can acquire MRSA from three sources: 1) colonization preceding admission; 2) during the surgical procedure; or 3) post-operatively from person to person spread.

- 40/93 patients had MRSA on admission (53 acquired MRSA after admission).
- 0/26 surgical patients who were MRSA+ before surgery and treated with CHG bathes and mupiricin and vancomycin surgical prophylaxis became MRSA infected.
- The measures of compliance with hand hygiene (amt alcohol used) or contact isolation precautions (if gowns/gloves present outside the room) were inadequate.
- AST done only on admission. Not weekly or at discharge.
- Sequential testing of surgical patients—not universal.

Does True Universal MRSA Screening Reduce Transmission and MRSA Infections?

Study Design: Observational, prospective interventional study with **universal screening** using MRSA-PCR on all admissions to three hospitals (total: 850 beds and 40,000 admissions per year) in Evanston, Ill.

- **Compared**: Passive surveillance (clinical detection-12m); Targeted surveillance cultures (clinical culture + high risk = ICU-12m); or Universal patient screening--21m.
- August 2005 to September 1, 2006.
- **Intervention**: Nasal screening. MRSA+ contact isolation, topical decolonization (mupricin).
- Poisson and segmented regression models used to compare prevalence density. [Robicsek et al. Annals Intern Med 2008;148:409-418](#)

Does Universal Screening Using PCR Control MRSA Transmission?

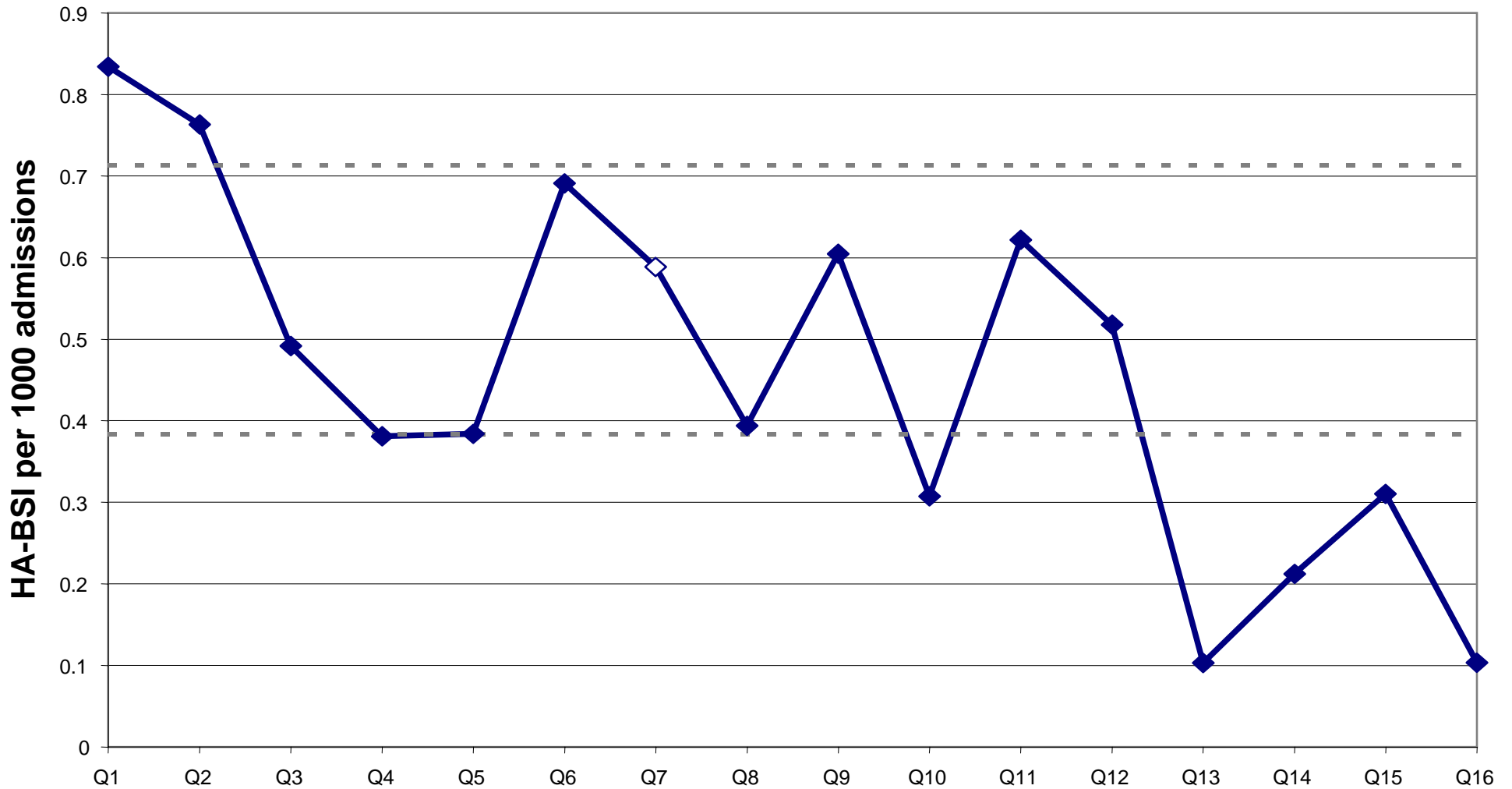
Results: >62,035 (84%) admissions tested.

- MRSA prevalence density (all body sites; per 10,000 patients):
 - Baseline = 8.9, ICU surveillance = 7.4, universal = 3.9.; $P < 0.001$
 - MSSA-BSI rate unchanged in all three periods.
 - Using segmented regression analyses, the aggregate hospital-associated MRSA disease prevalence density changed by -36.2% from baseline to ICU and -69.6% from baseline to universal screening.
- Surveillance with clinical cultures would have identified 17.8% of actual MRSA patient-days
- ICU-based surveillance would have identified 33.3% of actual MRSA patient days.
- >50% reduction in MRSA BSIs, respiratory, urinary tract and surgical site infections.
- **MRSA-BSI decreased by 75%!**

Conclusion: Universal screening detects large numbers of MRSA-colonized patients on admission who passive or targeted ICU surveillance might miss.

Robicsek et al. *Annals Intern Med* 2008;148:409-418

MRSA HA-BSI Prevalence, Evanston Hospital, 2004-2005



Cost-Benefit Analysis of Controlling MRSA

Compared:

Excess costs generated by MRSA infection with the costs of control program (surveillance cultures and isolation).

Concluded:

That control measures cost less than the infections and that this would remain so even if infection rates had declined by only 14%.

Chaix, et al. JAMA 1999;282:1745.

Cost-benefit Analysis of Detecting and Isolating MRSA Colonized Patients on ICU Admission

- A prospective study in 14 French ICUs for 6 months found that only universal screening detected MRSA carriage with acceptable sensitivity. A cost-benefit analysis confirmed that universal screening and preventive isolation saved money.

Lucet JC et al. Arch Intern Med. 2003;163:181-8.

Why is MRSA Held to a Different Standard? Reasons Given For Not Performing MRSA Screening or ADI

- “Lack of rigorous scientific data on how to control MRSA”; Insufficient data; need more research.
- Inadequate studies (quasi-experimental).
- Not randomized studies.
- Too costly (can't charge for screening).
- Not cost effective.
- Argue its “One-size fits all”

Why is MRSA Held to a Different Standard? Reasons Given For Not Performing MRSA Screening or ADI

- MRSA bundle—don't know the impact of the various intervention components.
- Legislation “mandates” universal screening.
- SHEA Guideline mandates universal screening.
- Screening (high-risk or universal) that dramatically reduced MRSA infection rates were just “regression to the mean”.
- Negative impact of contact isolation.

September 2008

HEALTH-CARE-
ASSOCIATED
INFECTIONS IN
HOSPITALS

An Overview of State
Reporting Programs
and Individual
Hospital Initiatives to
Reduce Certain
Infections



What Did The GAO Find?

"GAO reviewed a sample of 14 hospitals (including several hospital systems) with MRSA-reduction initiatives that were selected to provide variation in location, teaching status, and population of metropolitan area. GAO found **all use routine testing for MRSA**, although they chose different patient populations to test and used various testing methodologies. Three hospitals tested all patients for MRSA, while the other hospitals almost universally tested patients in adult or neonatal intensive care units. The hospitals reported changing their general infection control policies or practices as part of their initiatives—all 14 made changes for hand hygiene and more than half made changes to their contact precautions or disinfection of environmental surfaces. The hospitals GAO reviewed reported needing varying levels of funding and staff resources to implement and operate their initiatives, but **all hospitals that tracked MRSA infection rates reported a decline in MRSA infections** as a result of their initiatives. "

The Use of AST, Hand Hygiene, and Barrier Precautions (with environmental cleaning) Works To Control MRSA Transmission!!!

- In many, many (>200) studies this approach has been proven to control MRSA and/or VRE.
- This approach has been shown to be cost effective, even if as little as 14% of MRSA infections are prevented.
- This approach has worked in a variety of settings (endemic or epidemic MRSA), hospital types (acute or long-term care; small or large, university-affiliated or not), and countries (developed or those with limited resources).
- Why is MRSA treated differently than any other HAI???
- The public is tired of waiting for us to do what is right!



cardiology

ICU

orthopedic

oncology

dialysis

vascular surgery

In the United States, the public is demanding HAI prevention.

The Advent of Public Advocacy for HAI Control

Two examples:

The Consumer's Union (CU): A non-profit organization that previously had conducted independent evaluations of products for consumers and published their results. CU Mission statement: “...working for a fair, just and safe marketplace for all...”

The Institute for Healthcare Improvement (IHI): A non-profit organization leading the improvement of health care throughout the world, founded in 1991.

Action Consumers Union's First HAI Prevention Campaign

Stop Hospital Infections

Hospital infections are a leading cause of death in the U.S. Every year 90,000 Americans die from infections they get in the hospital. Most infections could be prevented if hospitals did a better job keeping patients safe. **The Stop Hospital Infections campaign** is working to put pressure on hospitals to improve patient care **by requiring them to publicly disclose their infection rates.** You can help by spreading the word about our campaign.

Goal: To require mandatory reporting of HAI rates in all States in the United States through legislation.

Lisa McGiffert

www.StopHospitalInfections.org

Stop Hospital Infections!

The Centers for Disease Control and Prevention estimates about 90,000 people die each year from hospital-acquired infections - more than from auto accidents and homicides combined.

Missouri residents, write the governor today!

California residents, click here!

These infections cost consumers almost \$5 billion each year, but you and I still can't see information about infection rates and other key measures of quality. Consumers Union is working to be sure we have the information we need to choose a good hospital and avoid a bad one.

Recently, the federal government took steps to improve access to data about hospital quality, but they do not include information about the effectiveness of a hospital's infection control practices. [Click here to find out about this initiative.](#)

Right now, federal regulators are seeking comments from consumers about the kind of information they should collect on hospital quality. Regulators say their goal is to get quality of care information to consumers so we can use the information to make decisions.

SEND YOUR EMAIL NOW to ask them to collect and report infection rates from every hospital so we can effectively choose among hospitals, and to give hospitals the strongest possible incentive to improve. Just complete the form on the left and send your message to Dr. Mark McClellan, Centers for Medicare and Medicaid Services and his staff. Feel free to edit the message. Your own voice make the letter stronger.

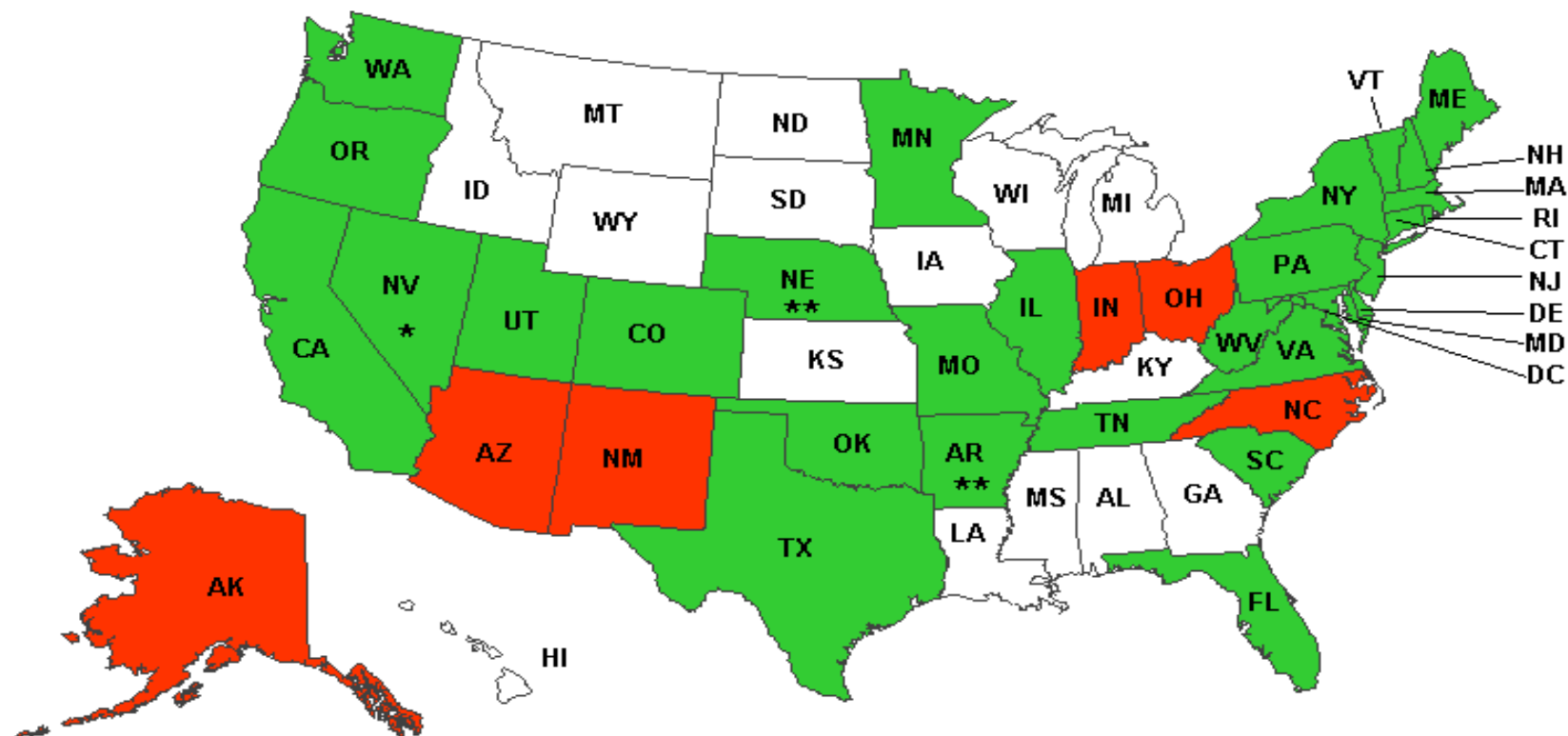
* = Required Fields





Title:

Send This Message

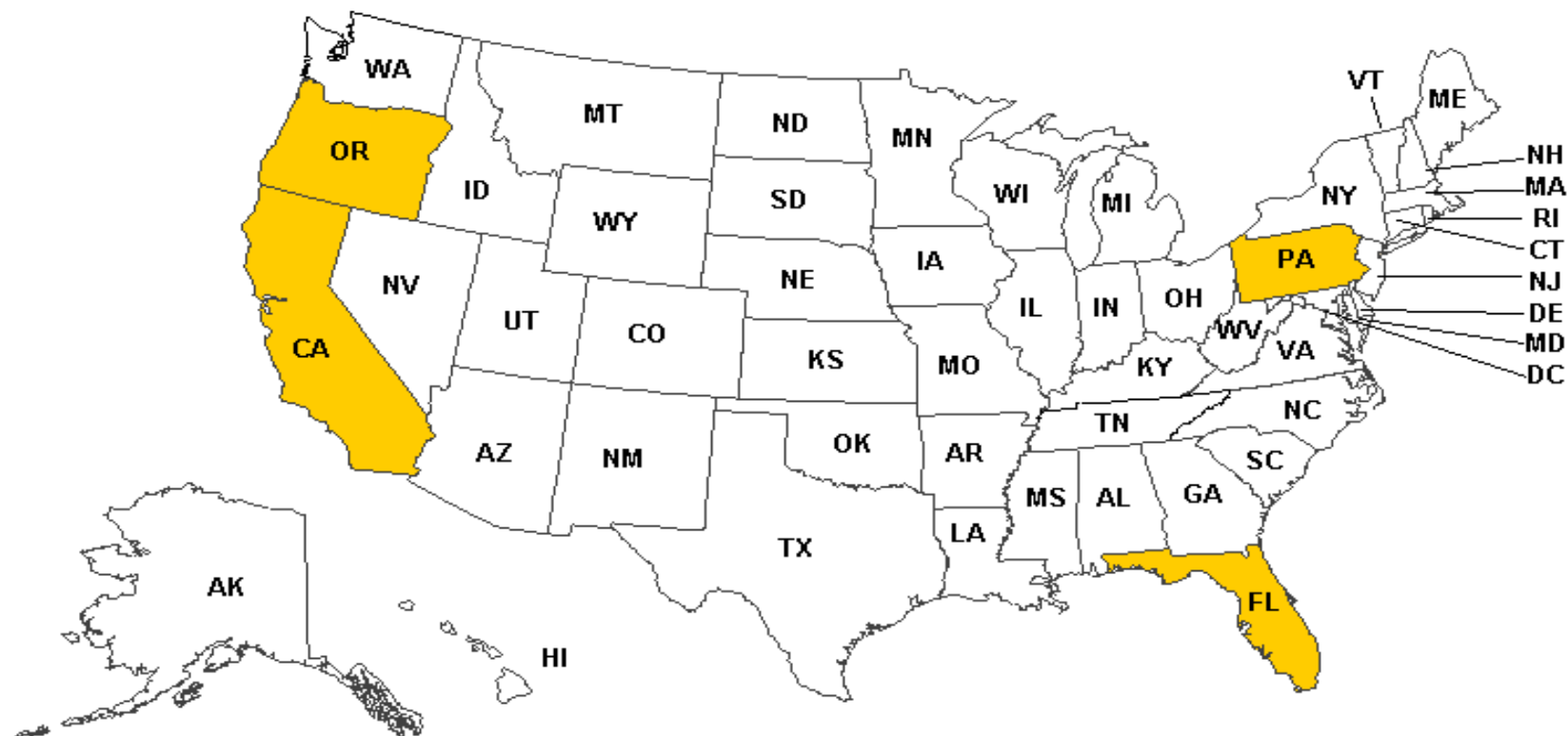
Listening session: report hospital infection rates

Healthcare-Associated Reporting Laws and Regulations



-  States with study laws
-  Mandates public reporting of infection rates
-  Mandates reporting only to state government
-  Voluntary

Mandatory HAI Reporting in Long-Term Care



- No HAI reporting required
- HAI reporting required

CONSUMER'S UNION

Your state's health department can help stop a dangerous "superbug" in local hospitals

A virulent "superbug," spreading in our hospitals, poses a **deadly risk to patients** and drives up the cost of hospital care. Most common antibiotics can't cure a Methicillin-resistant staphylococcus aureus (MRSA) infection, and people who develop it while in the hospital often suffer for years. MRSA often recurs, leading to additional hospitalizations and surgeries.

While some U.S. hospitals have implemented effective strategies to curb MRSA, most hospitals have not--but they will if the public demands action. This campaign has already raised awareness, but hospitals can do

more today!

Hospital infections can be secret, but your program and the problem serious action.

Act now! Just fill out the form and struggle in the "personalized

Stop the spread of MRSA hospital infections

Dear *[Decision Maker]*,

I am very concerned about the prevalence of antibiotic-resistant hospital-acquired infections in our state and I want you to do something about it.

One of the most dangerous of these infections is Methicillin-resistant staphylococcus aureus (MRSA) and hospitals are not doing enough to curb its spread.

Please personalize your message

I am asking you to direct the state agency responsible for regulation of hospitals to survey each hospital to find out what they are doing to prevent the spread of MRSA and post that information on a state government web site. We have a right to know which hospitals are using successful evidence-based techniques, such as those that have helped the University of Pittsburgh Medical Center reduce MRSA infections by 80 percent in selected intensive care units.

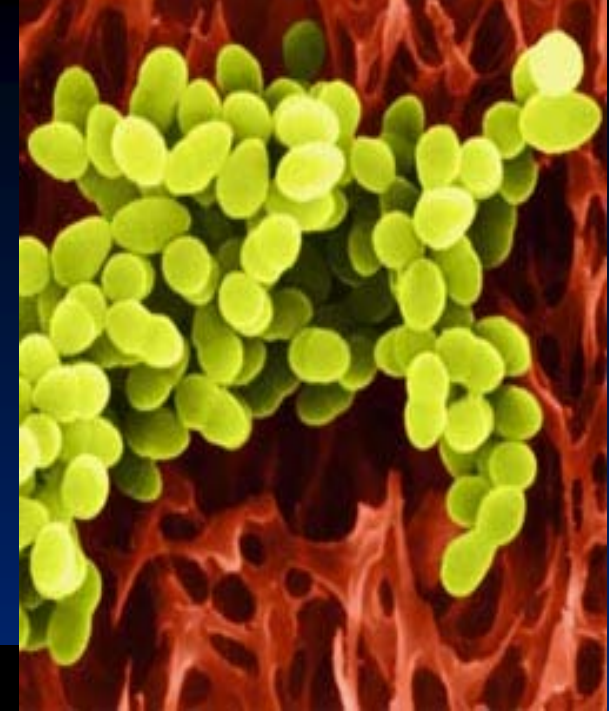
At a recent national conference in Boston, experts outlined the seriousness of MRSA, saying it is a more immediate threat to public health than bird flu or SARS. Some hospital representatives spoke of significantly reducing MRSA infections by using techniques such as "universal surveillance." Incoming patients are screened for MRSA so the bacteria can be eliminated and so hospital staff can use precautions to prevent the MRSA from spreading to other patients.

Seventeen Veterans Hospitals in Pennsylvania just launched an initiative to prevent the spread of MRSA that includes nasal swabs to test patients for the bacteria and then isolating them. A CDC spokesperson said this "will change the way every other health care facility thinks about MRSA."

There is much hospitals can do to address this problem. The release of new CDC guidelines for health care facilities to prevent spreading MRSA and other antibiotic resistant infections is imminent and will provide a roadmap for hospitals to use.

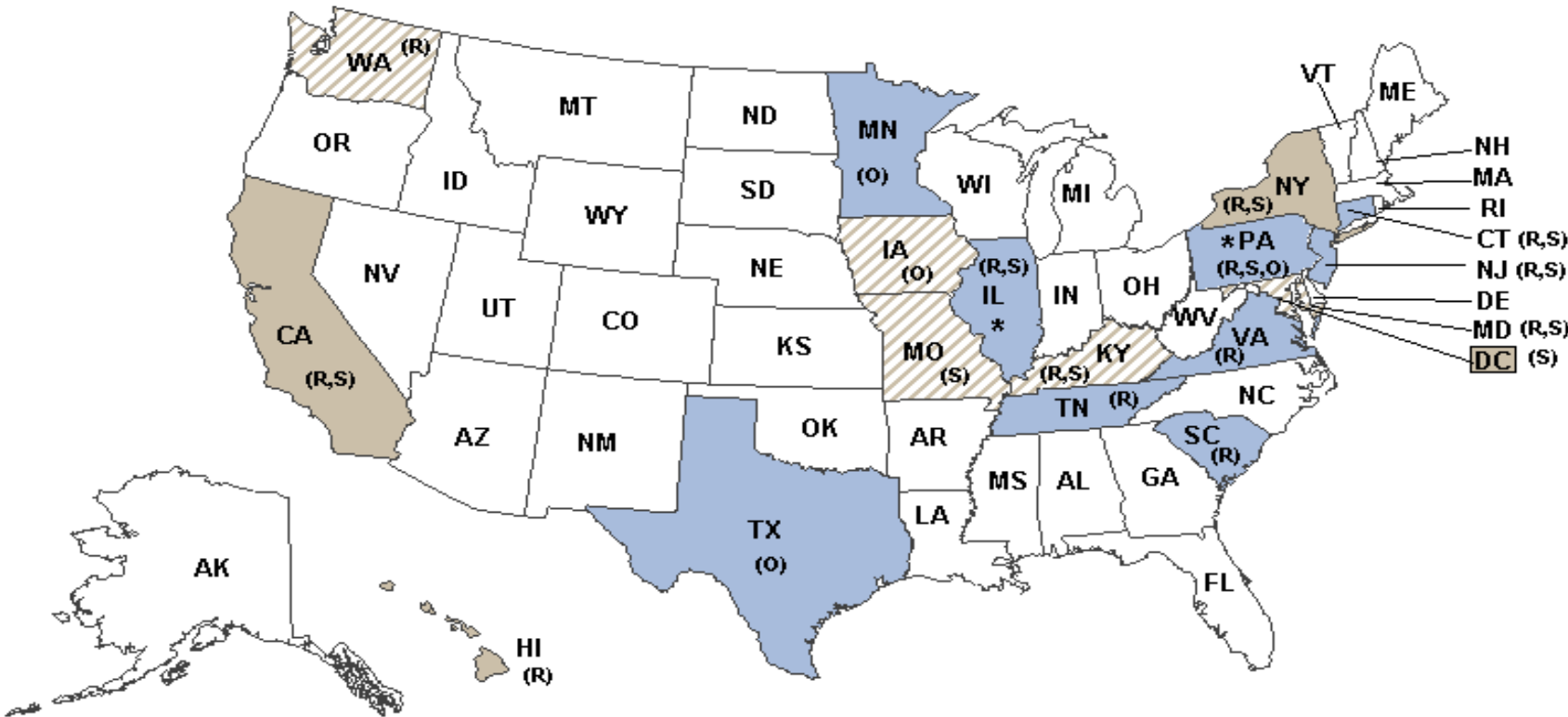
Please take action now to stop the spread of these deadly bacteria in our hospitals.

Sincerely,



can invade tissue and bone, ent.

MRSA Laws & Pending Legislation



- Enacted MRSA Law
- Pending MRSA Legislation
- * Enacted MRSA Law & Pending MRSA Legislation
- Legislature Adjourned Without Enactment
- R – Reporting Laws or Bills**
- S – Screening Laws or Bills**
- O – Other Laws or Bills (e.g., studies, pilots, other infection control requirements)**



cardiology

ICU

orthopedic

oncology

dialysis

vascular surgery

The Joint Commission is Demanding Enhanced HAI Prevention.

Joint Commission

2009 National Patient Safety Goal

NPSG.07.03.01

Implement evidence-based practices to prevent health care associated infections due to multiple drug-resistant organisms in acute care hospitals.

Note 1: This requirement applies to, but is not limited to, epidemiologically important organisms such as methicillin-resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile* (CDI), vancomycin-resistant Enterococci (VRE), and multiple drug-resistant gram negative bacteria.

Note 2: This requirement has a one-year phase-in period that includes defined expectations for planning, development, and testing (milestones) at three, six, and nine months in 2009, with the expectation of full implementation by January 1, 2010.

Elements of Performance for NPSG.07.03.01

- 1 As of April 1, 2009, the hospital's leadership has assigned responsibility for oversight and coordination of the development, testing, and implementation of NPSG.07.03.01.
- 2 As of July 1, 2009, an implementation work plan is in place that identifies adequate resources, assigned accountabilities, and a time line for full implementation of NPSG.07.03.01 by January 1, 2010.
- 3 As of October 1, 2009, pilot testing in at least one clinical unit is under way, for the requirements in NPSG.07.03.01.
- 4 As of January 1, 2010, the elements of performance in NPSG.07.03.01 are fully implemented across the hospital.
- 5 As of January 1, 2010: Conduct periodic risk assessments for multi-drug resistant organism acquisition and transmission. (See also IC.01.03.01, EPs 1-5)
- 6 As of January 1, 2010: Based on the results of the risk assessment, the hospital educates staff and licensed independent practitioners about health care associated infections, multi-drug resistant organisms, and prevention strategies at hire and annually thereafter.
Note: The education provided recognizes the diverse roles of staff and licensed independent practitioners and is consistent with their roles within the hospital. (See also HR.01.05.03, EP 4)
- 7 As of January 1, 2010: The hospital educates patients, and their families as needed, who are infected or colonized with a multi-drug resistant organism about health care associated infection strategies.



cardiology

ICU

orthopedic

oncology

dialysis

vascular surgery

The Center for Medicare and Medicaid Services (CMS) and Insurance Carriers are Demanding Enhanced HAI Prevention Through Pay for Performance

Deficit Reduction Act, 2005

- Required the Secretary, HHS to identify, by October 1, 2007, at least two conditions that:
 - are high cost, high volume or both
 - result in a higher payment when present as a secondary diagnosis
 - could “reasonably” be prevented by application of evidence-based guidelines

In the final rule, CMS selected 8 conditions for inclusion under the Hospital-Acquired Conditions, which are subject to payment reductions beginning on October 1, 2008.

CMS Identified 8 Preventable Conditions

Catheter-associated urinary tract infections

Mediastinitis following Coronary Artery Bypass Graft (CABG) procedures

Infections due to central venous catheters

Pressure ulcers

Injury to patients (falls, burns, crushing injury)

Retained foreign body after surgery

Air embolism

Transfusion of incompatible blood

Outcome of Losing Complication and Co-morbidity Payment

- Hospitals face losing revenue while still having to treat expensive complications
- CMS is encouraging proactive efforts to reduce preventable complications
- Hospitals that proactively implement prevention strategies should benefit



The information provided represents no statement, promise, or guarantee by ETHICON concerning coverage, levels of reimbursement, payment, or charge. Please consult your payor organization with regard to local or actual coverage and reimbursement policies and determination processes.



cardiology

IHI

orthopedic

oncology

dialysis

vascular surgery

Private and Non-Profit Organizations are Demanding Enhanced HAI Prevention—An Example---**The Institute for Healthcare Improvement (IHI).**

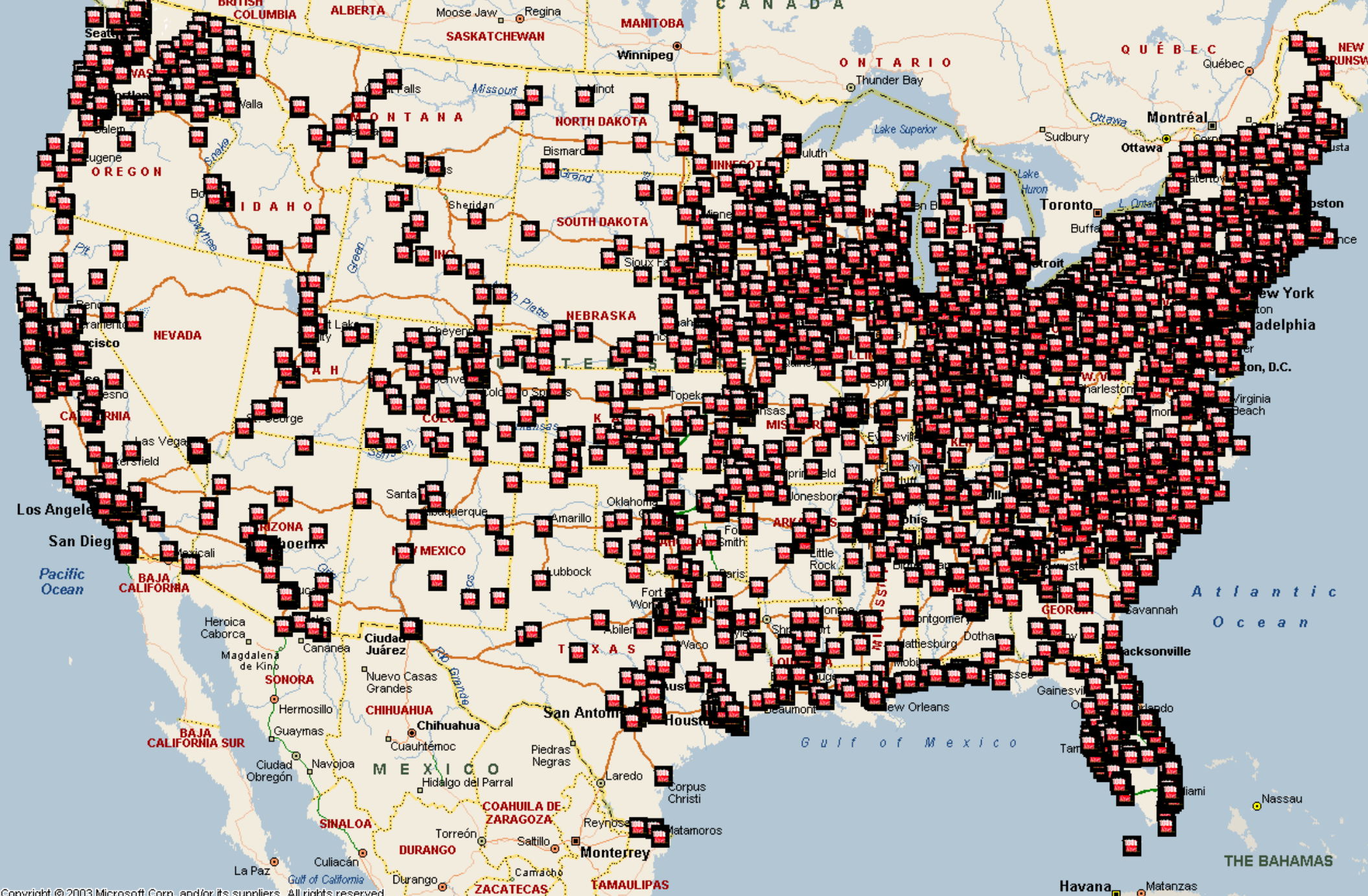
100,000 Lives Campaign Objectives (December 2004 – June 2006)

- **Save 100,000 lives**
- **Enroll more than 2,000 hospitals in the initiative**
- **Build a reusable national infrastructure for change**
- **Raise the profile of the problem (variability in the quality of American health care) - and our proactive response**

The IHI Save 100,000 Lives Platform

The six interventions from the 100,000 Lives Campaign:

- **Deploy Rapid Response Teams...**at the first sign of patient decline
- **Deliver Reliable, Evidence-Based Care for Acute Myocardial Infarction...**to prevent deaths from heart attack
- **Prevent Adverse Drug Events (ADEs)...**by implementing medication reconciliation
- **Prevent Central Line Infections...**by implementing a series of interdependent, scientifically grounded steps
- **Prevent Surgical Site Infections...**by reliably delivering the correct perioperative antibiotics at the proper time
- **Prevent Ventilator-Associated Pneumonia...**by implementing a series of interdependent, scientifically grounded steps



The 100,000 Lives Campaign Scorecard

- An estimated 122,300 lives saved by participating hospitals
- >3,100 hospitals enrolled
 - >78% of all discharges
 - >78% of all acute-care beds
 - >85% of participating hospitals sending IHI mortality data
- Participation in Campaign interventions:
 - Rapid Response Teams: 60%
 - AMI Care Reliability: 77%
 - Medication Reconciliation: 73%
 - Surgical Site Infection Bundles: 72%
 - Ventilator Bundles: 67%
 - Central Venous Line Bundles: 65%
 - All six: 42%

The Save 100,000 Lives Campaign Supporters

Blue Cross Blue Shield of Massachusetts

Cardinal Health Foundation

Rx Foundation

Gordon and Betty Moore Foundation

The Colorado Trust

Blue Shield of California Foundation

Robert Wood Johnson Foundation

Baxter International, Inc.

The Leeds Family

David Calkins Memorial Fund

PROTECTING

5 Million

Lives

FROM HARM

IHI.org

We are asking hospitals participating in the Campaign to prevent five million incidents of medical harm over the next two years.

The IHI 5 Million Lives Platform

New interventions targeted at harm:

- **Prevent Pressure Ulcers...** by reliably using science-based guidelines for their prevention
- **Reduce Methicillin-Resistant *Staphylococcus aureus* (MRSA) Infection...** by reliably implementing scientifically proven infection control practices
- **Prevent Harm from High-Alert Medications...** starting with a focus on anticoagulants, sedatives, narcotics, and insulin
- **Reduce Surgical Complications...** by reliably implementing all of the changes in care recommended by the Surgical Care Improvement Project (SCIP)
- **Deliver Reliable, Evidence-Based Care for Congestive Heart Failure...** to reduce readmissions
- **Get Boards on Board....** Defining and spreading the best-known leveraged processes for hospital Boards of Directors, so that they can become far more effective in accelerating organizational progress toward safe care

Save 5 Million Lives From Harm Campaign Supporters

**America's Blue Cross and Blue Shield
health plans**

Cardinal Health Foundation

Blue Shield of California Foundation

Aetna Foundation

Baxter International, Inc.

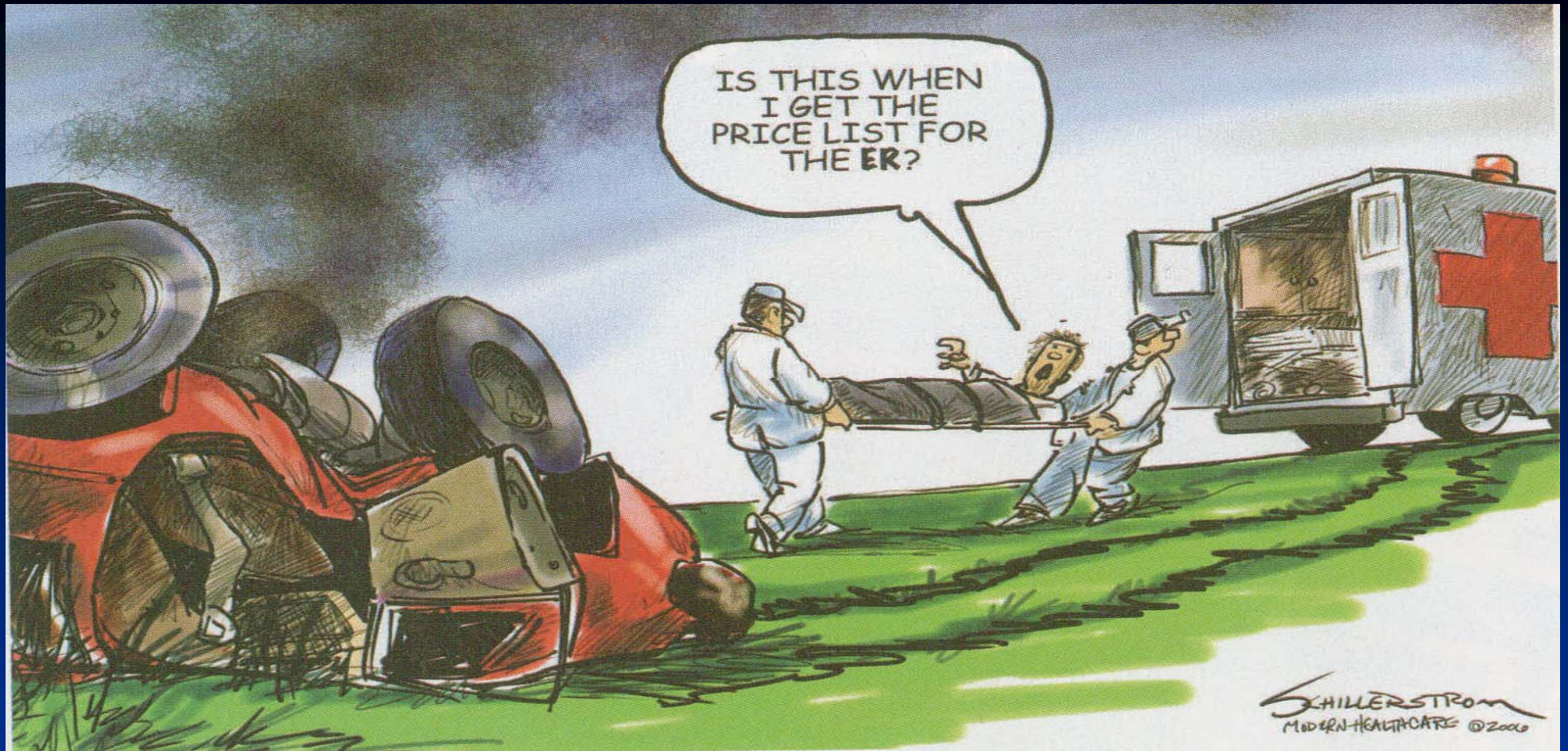
Abbott Fund

What Leadership Should Do

- Acknowledge the magnitude and consequences of the problem:
 - Emphasize the “business case” for HAI reduction – certainly cost-beneficial and probably cost-saving;
- Encourage intolerance of the status quo and have the will to improve – “getting to zero” is possible;
- Empower front-line multi-disciplinary teams to get the job done, and provide necessary supplies, resources, and personnel
 - Infection control, microbiology, and environmental services;
- Hold clinical staff accountable for reliable performance of basic infection control practices, such as hand hygiene, once appropriate systems and supplies are in place— **Infection control is everyone’s business! Demand Compliance;**
- Review data regularly and remove barriers to success.

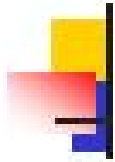
Recent Federal Activity

- ◆ House Resolution – “The Murphy Bill”
- ◆ HR 1448 – VA Hospital Quality Report Card Act of 2007
- ◆ S 2287 – includes HAI rates in HR
- ◆ HR 3697--Strategies To Address Antimicrobial Resistance (STAAR) Act
- ◆ HR 2900 – FDA Amendments
 - ◆ Murphy amendment to study HAI related to devices, sterilization, and policies, practices and procedures



“We can drive the train, or we can wait until it runs over us.” - Wisconsin CEO when asked, Why Public Report? January 2000

Safety Starts With You!



Thank you!