

# A Public Health Perspective on Hospital Associated Infections (HAIs) Caused by Methicillin-Resistant Staphylococcal Aureus (MRSA) :

## *What Would Rex Morgan Do?*

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# Rex Morgan, MD, Takes on MRSA

## REX MORGAN



- Community-wide impact of MRSA
- Use of public health tools to prevent or control the spread of MRSA
- Hospitals as points of intervention
- Statewide partnership

# Focus: MRSA as MDRO & HAI

- Proxy for other Healthcare-Associated Infections (HAI's), including:
  - Acinetobacter
  - Serratia
  - Pseudomonas
- Most common sites of HAI's:
  - Urinary Tract Infections
  - Surgical Site Infections
  - Bloodstream infections





# Characterizing the Impact of MRSA

- MRSA in hospitals
- Prevalence of colonization (carriage of bacteria) in population
- Kinds of acute illness caused by MRSA

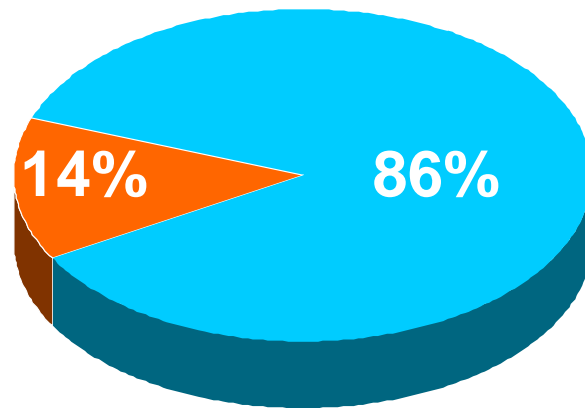


# MRSA Hospital Prevalence Survey: AJIC

- 21% of all acute care hospitals nationwide responded (64% urban, 36% rural)
- 4.6 out of 100 hospitalized patients known to be colonized *or* infected with MRSA



# Most *Invasive* MRSA Infxn: Healthcare-Assoc.



■ **Community-Associated**

■ **Healthcare-Associated**

**Klevens et al JAMA 2007;298:1763-71**

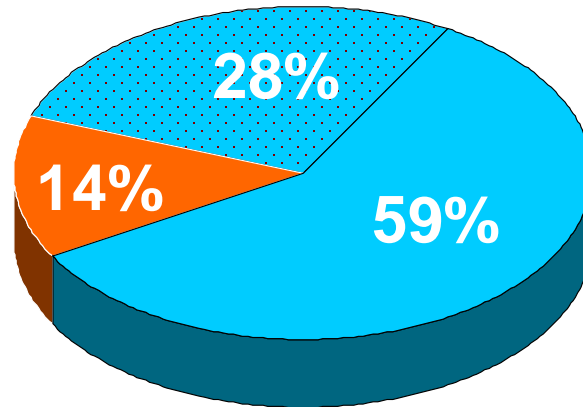
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# Increasing Costs of MRSA

- From 1999-2005, total annual hospitalizations increased 8%, while MRSA-related hospitalizations doubled (Klein et al., 2007)
- Longer hospital stays and more resource-intensive care for MRSA patients, when compared to those with MSSA (Kopp et al., 2004 & Cosgrove et al. 2005)
- Estimated \$3.2-\$4.2 billion nationwide to treat hospitalized patients with MRSA (Pfizer Inc., 2005), based on 120,00 patients hospitalized per year (CDC)
- Data on out-patient costs scarce

# Most Healthcare-Associated *Invasive* MRSA Infection: Community-Onset

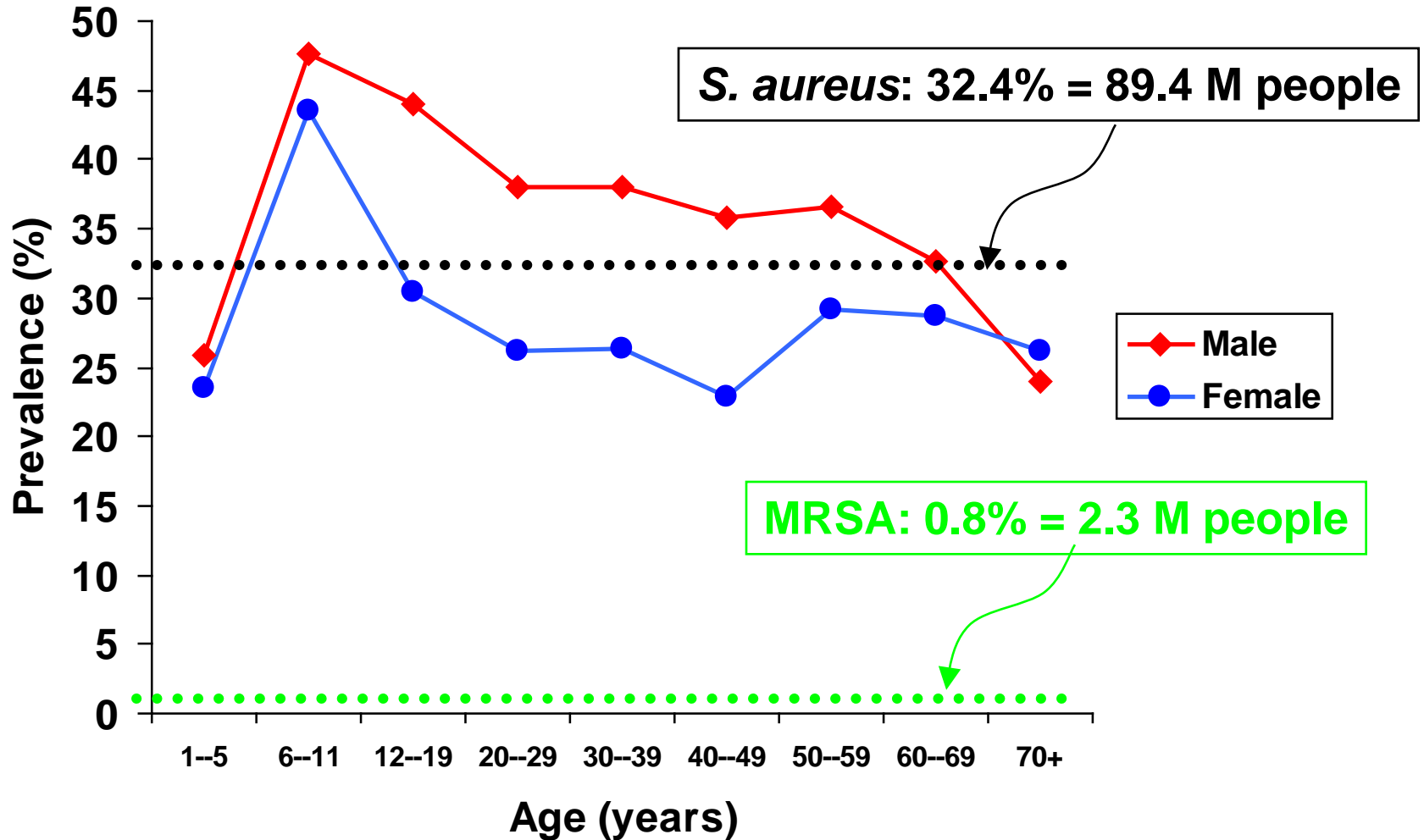


- **Community-Associated**
- **Healthcare-Associated (hospital-onset)**
- **Healthcare-Associated (community-onset)**

Source: ABCs Population-based Surveillance System, Klevens et al. JAMA 2007



# S. aureus vs. MRSA Nasal Colonization



# CA-MRSA: Skin Infections Common

<b>Disease Syndrome</b>	<b>(%)</b>
<b>Skin/soft tissue</b>	<b>1,266 (77%)</b>
<b>Wound (Traumatic)</b>	<b>157 (10%)</b>
<b>Urinary Tract Infection</b>	<b>64 (4%)</b>
<b>Sinusitis</b>	<b>61 (4%)</b>
<b>Bacteremia</b>	<b>43 (3%)</b>
<b>Pneumonia</b>	<b>31 (2%)</b>

Fridkin et al NEJM 2005;352:1436-44

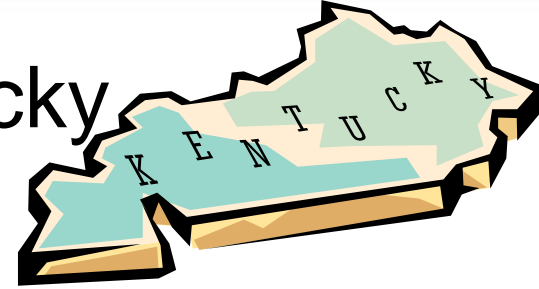


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# Kentucky-Specific Impact

- No reason to suspect that Kentucky is different from the nation
- While individual cases of MRSA are not reportable to health departments in KY, clusters & outbreaks of cases are reportable by law
- Each year (especially in the fall)--- outbreaks related to sports teams are reported
- In 2006, KY, OH and VT reported outbreaks associated with tattoo parlors (*MMWR*, June 23, 2006)



# Why are certain diseases reportable to health authorities and others not?

3 types of diseases are usually reportable:

- *Rarely seen diseases*
- *Diseases that have high case-fatality rates*
- Those that have *specific public health measures or actions*, such as quarantine, post-exposure antibiotics for exposed persons, or pre-exposure immunization to prevent illness.





# Mission: KY Dep't for Public Health

To promote and protect the health and safety of Kentuckians through professional service



**The *community* is the patient in public health.**



# Shared Goals

Public Health shares consumer goals:

- Patient safety
- Limiting the development of bacterial resistance
- Decreasing the spread of Multidrug-Resistant Organisms



# Approaches to Prevention & Control of Multi-Drug Resistant Organisms (MDRO's)

- Prevent formation of multi-drug resistant organisms
- Control spread of MRSA in the community
- ***Control spread of MRSA in health care settings***

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IS IT A SPIDER BITE?

IF YOU THINK YOU HAVE A SPIDER BITE, IT MIGHT ACTUALLY BE AN INFECTION THAT NEEDS MEDICAL ATTENTION.

**WHEN IN DOUBT, CHECK IT OUT.**



[www.cdc.gov/mrsa](http://www.cdc.gov/mrsa)



# Hospitals as Points of Intervention

- Recognized health leaders in communities
- Captive audience for interventions: both health-care professionals and patients
- A more controlled environment for data collection
- Higher rates of MRSA and invasive disease in hospitalized patients



# Using Public Health Framework & Tools to Develop & Implement Potential Strategies

- Assessment: surveillance of infections, surveillance of isolates to determine community-specific resistance patterns
- Policy Development: formulation of policies designed to reduce spread in various settings
- Assurance: education of public & health providers about recognition & treatment, empowerment & education of public about appropriate antibiotic use and risk reduction



# Assessment: Difficulty Measuring MRSA

## Surveillance-What to count or track

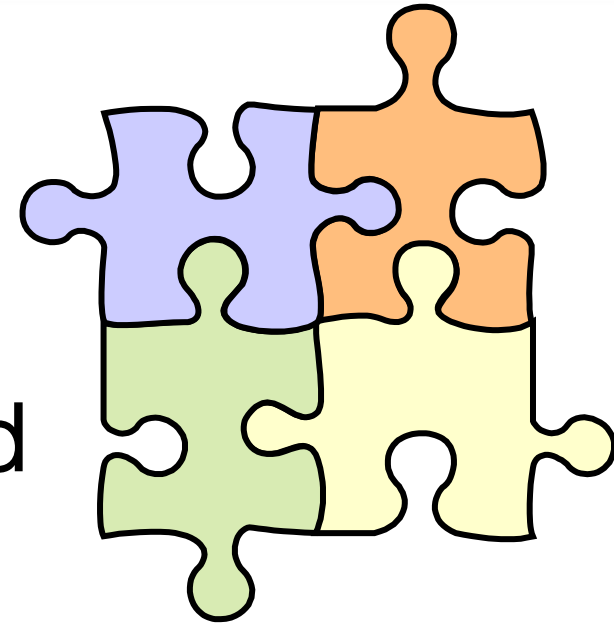
- Colonization vs. Infection?
- Healthcare-Associated vs. Community-Associated?
- Systemic infections vs. localized infections?
- Clinically diagnosed infections vs. microbiologically diagnosed infections?
- Process vs. outcome measures
- ICU or surgical patients vs. all patients





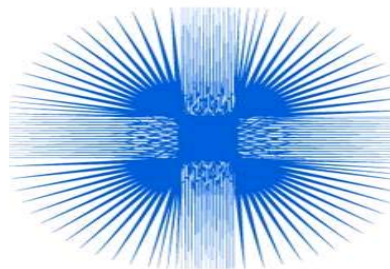
# Challenges to Hospital Reporting

- Standardization of data
- Resources: both hospital and government
- Legal authority
- Technological transfer of data
- Validation and accuracy of data



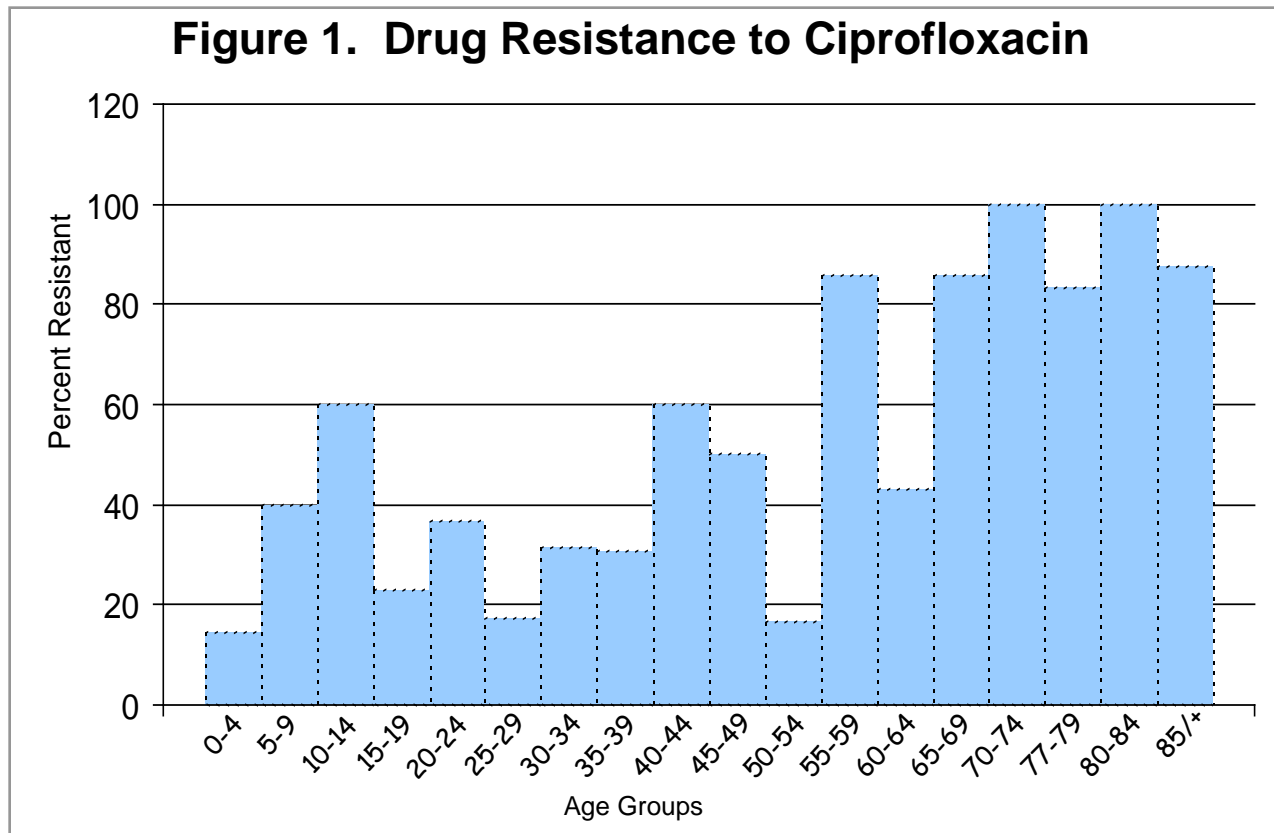
# What is the National Healthcare Safety Network (NHSN)?

- Voluntary, secure, free, internet-based surveillance system/database managed by CDC
- Designed to collect and analyze data related to patient and personnel safety
- Can track and share data (as appropriate) on healthcare-associated infections



**NHSN**  
National Healthcare  
Safety Network

# Assessment: MRSA Antibiogram



Antibiograms could help ease pressure for broad spectrum antibiotic use and preserve effectiveness of preferred antimicrobial agents.

# Policy Development: Guidance for Hospitals

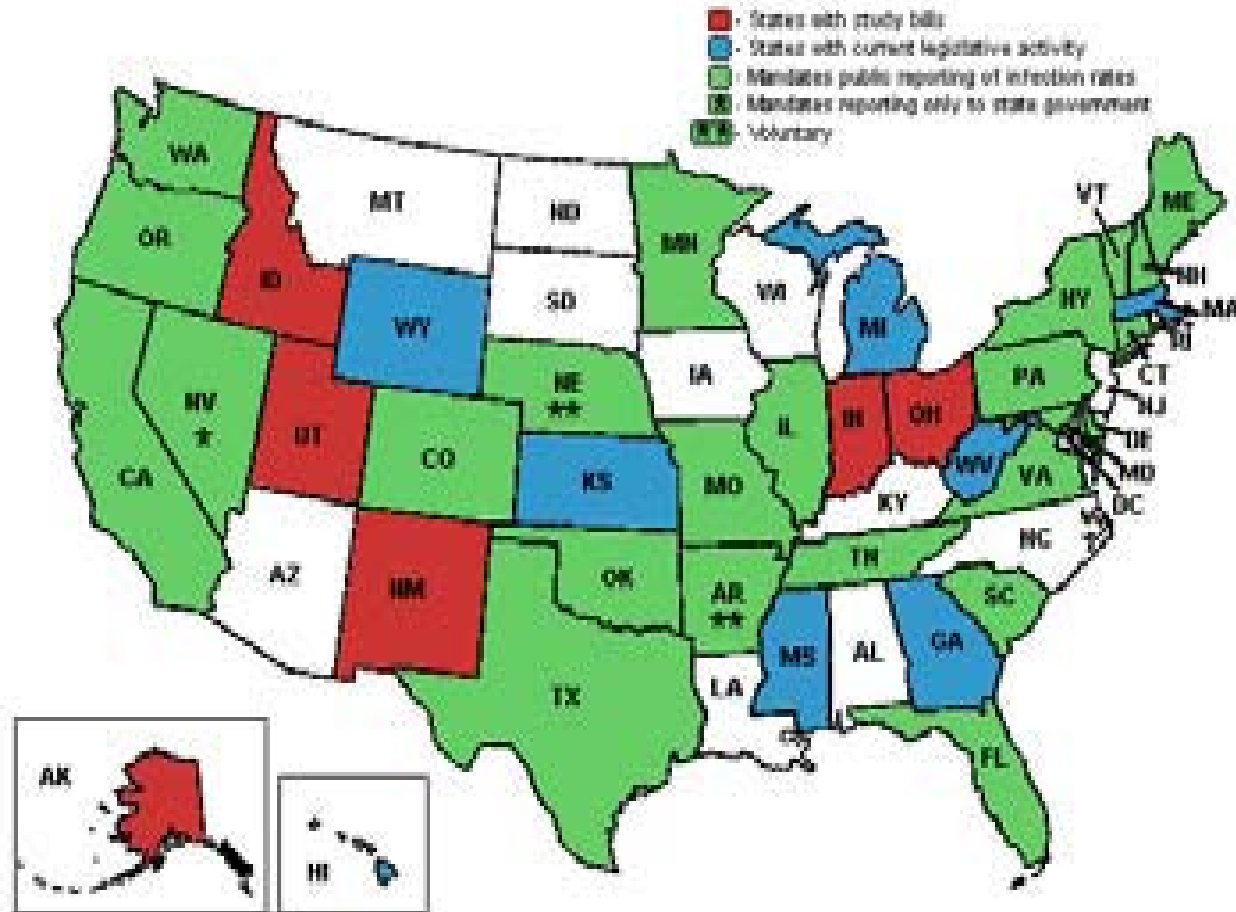
- Handwashing
- Contact precautions
- Environmental cleaning
- Antibiotic stewardship
- Active surveillance??

CDC: *Management of Multidrug Resistant Organisms in Healthcare Settings:*

[http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdro\\_guideline2006.pdf](http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdro_guideline2006.pdf)

States (e.g., NJ and NE) have also published comprehensive guidelines

# Legislative Mandates for Public Reporting of Healthcare- Assoc. Infections, October 2007



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# Policy: Legislative Mandates for Reporting

- Advantages:
  - Transparency for the consumer
  - Should result in improved hospital outcomes
- Challenges:
  - Redirection of resources
  - Best way to effect change?
  - Do consumers choose differently, based on the data?
  - Will hospitals be pushed to compromise on reported data?

# Assurance: Targeted Education and Empowerment

- Workplace-specific messages
- Provider/ healthcare worker messages
- Public messages: patients and families
- Messages of both risk-reduction and prevention of antibiotic resistance



# Preventing & Controlling MDRO's: A Shared Responsibility

MDRO's like MRSA affect all societal sectors.

Collaborations open the door to...

- Opportunities to share successes and “best practices”
- Resource-sharing opportunities
- Better position to leverage additional resources
- Overcoming some common limitations: budgets, redundancies, etc...

# Working Together: A Call to Collaborate

“Great discoveries and improvements invariably involve the cooperation of many minds.”

-Alexander Graham Bell

Effective community control is multifaceted



# Kentucky MRSA Summit

- July 31-August 1, 2008
- Objectives:
  - to educate and engage a variety of disciplines about MRSA transmission and control
  - to explore barriers and potential solutions for preventing the spread of MRSA in different workplace settings
  - to develop a nucleus of interested parties that could serve on an MRSA collaborative group and a larger group that would follow-through with initiatives at the community level

# Kentucky's MRSA Collaborative Group

## Who is participating in the group?

Representatives from:

- Hospitals
- Long-term Care Facilities
- Public Health
- Law Enforcement
- EMS
- Corrections
- Education
- Universities

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Sharing isn't always caring.



SHARING PERSONAL  
ITEMS LIKE TOWELS,  
RAZORS, OR TWEEZERS  
CAN SPREAD DISEASES.



[www.cdc.gov/mrsa](http://www.cdc.gov/mrsa)





# Seal the Deal

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## Pepper . . . And Salt

THE WALL STREET JOURNAL



*“There’s nothing like a little  
hand sanitizer to seal a deal.”*