



# **The Medical Errors Reduction and Healthcare Quality Initiatives of the Institute of Medicine**



***The Institute of Medicine serves as adviser  
to the nation to improve health.***

As an independent scientific adviser, the Institute of Medicine strives to provide advice that is unbiased, based on evidence and grounded in science.

The mission of the Institute of Medicine embraces the health of people everywhere.

## *The National Academy of Sciences Charter*

“whenever called upon by any department of Government, investigate, examine, experiment and report upon any subject of science or art, the actual expense of such investigations, examinations, experiments and reports to be paid from appropriations which may be made for the purpose, but the Academy shall receive no compensation whatever for any services to the Government of the United States”

"All the News  
That's Fit to Print"

# The New York Times

**Late Edition**  
New York: Today, partly sunny and cold, high 37. Tonight, cloudy, breezy and cold, low 25. Tomorrow, sunny and cold, high 37. Yesterday, high 45, low 38. Weather map is on Page D4.

VOL. CXLIX . . . No. 51,722

Copyright © 1999 The New York Times

NEW YORK, TUESDAY, NOVEMBER 30, 1999

\$1 beyond the greater New York metropolitan area.

75 CENTS



## As Trade Talks Start in Seattle

About 2,000 demonstrators protested against the World Trade Organization negotiations that began yesterday. They said the talks, which President

Clinton is attending as part of his foreign policy, undercut health, safety and environmental standards as they seek to lower trade barriers. Page A14.

## INVESTIGATORS DIG FOR MASS GRAVES AT MEXICO BORDER

### DRUG GANGS SUSPECTED

Authorities Think Informants, Including Americans, May Be Buried Near Juárez

By **LOWELL BERGMAN** and **TIM GOLDEN**

Mexican authorities, backed by F.B.I. investigators, began yesterday to excavate sites near the Texas border that they believe may hold the bodies of scores of Mexicans and Americans who disappeared in the last several years and who are thought to have been killed by drug traffickers.

The search for bodies, an American law enforcement official said, was prompted by a tip from an informer recruited by the F.B.I. who acknowledged complicity in several killings and identified the locations of what he said were at least two mass graves on the outskirts of Ciudad Juárez, the Mexican city just across from El Paso.

The informer, identified by the American official as a former Mexican police officer, said as many as 200 people might be buried in several graves, and that some of those killed had been providing information to American law enforcement agencies. An American official said the informer had passed a lie detector



Frances Roberts for The New York Times  
Nasser K. Ahmed after his release from a federal detention center.

## U.S. Frees Man Jailed 3 Years On Secret Data

By **BENJAMIN WEISER**

Attorney General Janet Reno declined to block the release last night of an Egyptian man who had been held for three and a half years in a New York jail on secret evidence that the F.B.I. had said linked him to terrorists in the United States and Egypt.

When Ms. Reno did not intervene in the case of Nasser K. Ahmed, he

## GROUP ASKING U.S. FOR NEW VIGILANCE IN PATIENT SAFETY

### WANTS A FEDERAL AGENCY

Academy of Sciences Asserts That Rate of Medical Errors Is 'Stunningly High'

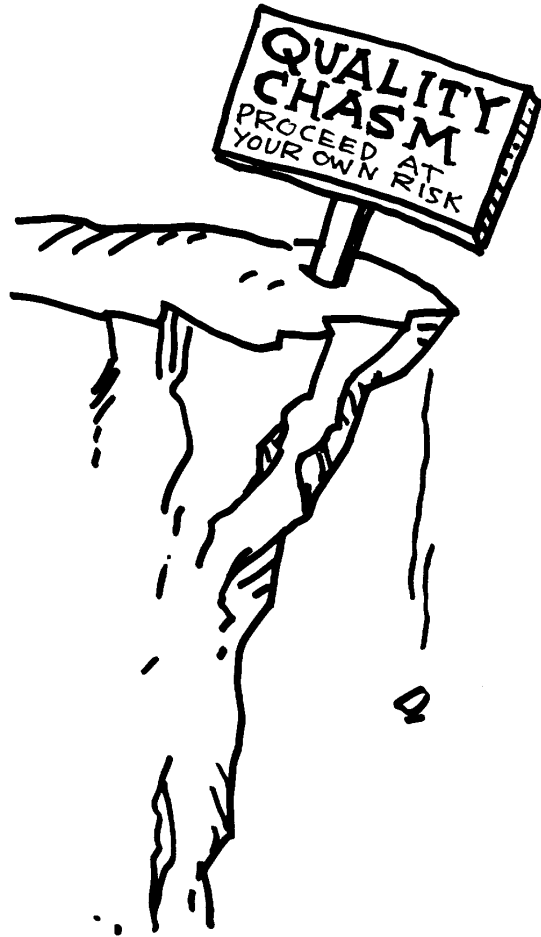
By **ROBERT PEAR**

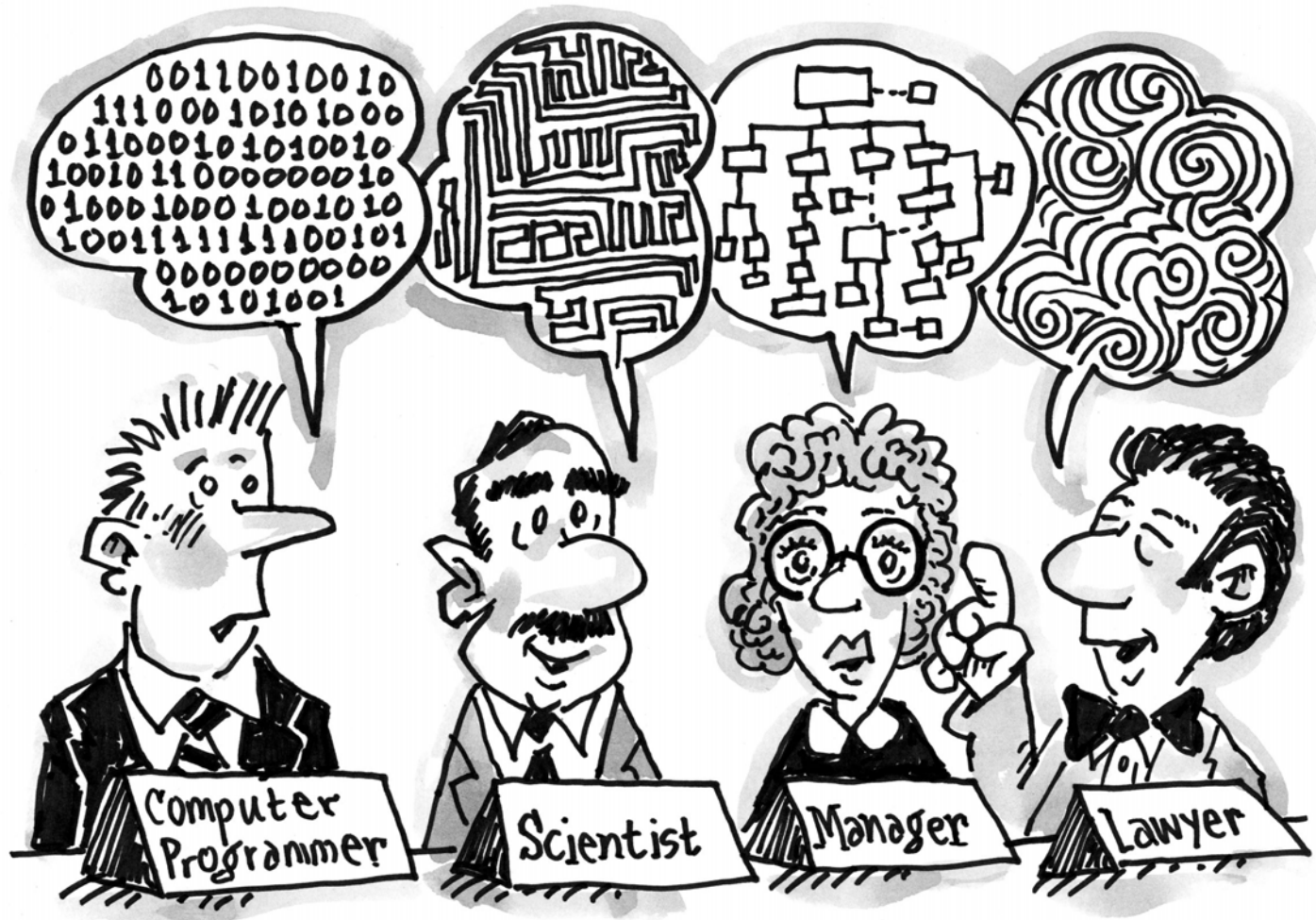
WASHINGTON, Nov. 29 — Citing evidence that medical errors cause tens of thousands of deaths each year, the National Academy of Sciences called today for a new federal agency to protect patients and said Congress should require all health care providers to report mistakes that cause serious injury or death.

In a report, the academy's Institute of Medicine said that "health care is a decade or more behind other high-risk industries in its attention to ensuring basic safety."

In hospitals alone, the report said, research suggests that medical errors kill 44,000 to 98,000 people a year, compared with the toll from highway accidents, about 43,450, breast cancer, 42,300, or AIDS, 16,500.

The chairman of the panel that conducted the study, William C. Richardson, said, "These stunningly high rates of medical errors — resulting in deaths, permanent disability and unnecessary suffering — are simply unacceptable in a medical system that promises first to 'do no harm.'" Mr. Richardson is president





# *Quality Series Reports (1999–continuing)*

- *To Err is Human: Building a Safer Health System (1999)*
- *Crossing the Quality Chasm: A New Health System for the 21st Century (2001)*
- *Leadership by Example: Coordinating Government Roles in Improving Health Care Quality (2002 )*
- *Fostering Rapid Advances in Health Care: Learning from System Demonstrations (2002)*
- *Priority Areas for National Action: Transforming Health Care Quality (2003)*
- *Unequal Treatment (2003)*
- *Health Professions Education: A Bridge to Quality (2003)*
- *Keeping Patients Safe: Transforming the Work Environment of Nurses (2003)*
- *Patient Safety: Achieving a New Standard for Care (2003)*
- *When Children Die (2003)*
- *Health Literacy (2004)*
- *Quality Chasm Summit on Priority Areas (2004)*

## *Studies underway or about to begin*

- Benefits, Payment and Performance Improvement
- Behavioral Health Care
- Drug Safety and Quality
- Rural Health Care Quality
- Emergency Medicine
- Providing Quality Cancer Care in Low and Middle Income Countries



*Leadership By Example:  
Coordinating Government Roles in  
Improving Health Care Quality*

**Committee on  
Enhancing Federal Healthcare  
Quality Programs**

# *Study Context*

- 1990s - Extensive growth in performance measurement activities
- 1998 - Establishment of various coordinating bodies to encourage standardization of measures and collaboration
  - Quality Interagency Coordinating Task Force
  - The Leapfrog Group
  - National Quality Forum

## *Study Context*

- Development of a Common Conceptual Framework for Performance Measurement and Reporting
  - National HealthCare Quality Report
  - 6 National Aims: safe, effective, patient-centered, timely, efficient and equitable
  - Priority Areas

## *Study Context*

- Slow, but steady growth in public reporting initiatives in both public and private sector
  - NCQA HEDIS
  - AHRQ/CAHPS
  - CMS nursing home, others under development
  - Many regional efforts

# *Focus of IOM Committee*

## PART I – Review of 6 Major Programs

Medicare

Medicaid

SCHIP

VHA

DOD TRICARE

HIS

## PART II – Analysis of Current Efforts and Identification of Areas for Improvement

# *Government Health Care Programs in Fiscal Year 2001*

<b>Program</b>	<b>Beneficiaries</b>	<b>Expenditures</b>
Medicare	40.0 million aged and disabled	\$242.4 billion
Medicaid	42.3 million low-income persons	\$227.9 billion (joint federal and state)
SCHIP	4.6 million low-income children	\$4.6 billion (joint federal and state)
VHA	4.0 million veterans	\$20.9 billion
DOD TRICARE	8.4 million active-duty military personnel and their families, and military retirees	\$14.2 billion
IHS	1.4 million American Indians and Alaska Natives	\$2.6 billion
<b>TOTAL</b>	<b>About 100 million people</b>	<b>\$512.6 billion</b>

# *Current Quality Enhancement Efforts Will Not Close the Quality Gap*

- Lack of consistency in performance measurement requirements across and within programs
- Absence of standardized performance measures resulting in excess burden and diminished usefulness of information
- Lack of conceptual framework to guide the selection of measures and focus efforts

# *Current Quality Enhancement Efforts Will Not Close the Quality Gap*

- Lack of computerized clinical data, except in VHA and DOD
- Lack of strong commitment to transparency
- Absence of a systematic approach for assessing the impact of quality enhancement activities

# *Federal Leadership is Needed Now*

## *Recommendation 1*

The federal government should assume a strong leadership position in driving the health care sector to improve the safety and quality of health care services provided to the approximately 100 million beneficiaries of the six major government health care programs. Given the leverage of the federal government, this leadership will result in improvements in the safety and quality of health care provided to all Americans.



## *Many Levers to Influence Quality*

- Largest purchaser
- Most influential regulator
- Operates some of the largest delivery systems
- Sponsors applied health services research and demonstrations

# *Federal Leadership is Needed Now*

## *Recommendation 2*

The federal government should take maximal advantage of its unique position as regulator, health care purchaser, health care provider, and sponsor of applied health services research to set quality standards for the health care sector.

# *Capacity to Measure Performance is Critical*

- The federal government is seriously hampered in performing purchasing, regulatory and provider functions by a lack of information on clinical quality.
- A stronger “quality infrastructure” must be built.

# *Building a Quality Infrastructure*

## *Recommendation 3*

Congress should direct the Secretaries of the Department of Health and Human Services, Department of Defense, and Department of Veterans Affairs to work together to establish standardized performance measures across the government programs, as well as public reporting requirements for clinicians, institutional providers, and health plans in each program.

## *Building a Quality Infrastructure*

- QuIC should promulgate standardized performance measures for 15 priority areas or conditions in FY03-04.
- Measures should be implemented by the six government programs.
- Starting in FY07, submission of patient-level data as a COP for providers.
- Starting in FY08, each program should make comparative quality reports and data available in the public domain.

# *Data Repository*

- Government programs should work with AHRQ to establish a mechanism for pooling performance measurement data
- Contributions from private sector insurance programs should be encouraged
- Public afforded access to the repository
- De-identified patient data and other privacy protections

# *Research, Demonstrations and Evaluation*

- The six government programs should work together to develop a research agenda that will support their quality enhancement efforts.
- AHRQ should staff the QuIC and provide the organizational locus of QuIC research activity.



# *Keeping Patients Safe:*

Transforming the Work  
Environment of Nurses

# *Committee Charge*

- Identify key aspects of the work environment of nurses that likely impact patient safety.
- Identify potential improvements in health care working conditions that would likely increase patient safety.

# *Keeping Patients Safe*

Builds on two prior IOM Reports: *To Err is Human* and *Crossing the Quality Chasm*.

- More deeply addresses certain patient safety issues; e.g., organizational cultures of safety
- Addresses new issues; e.g., staffing and work hours / fatigue
- Unifies all three reports into a framework for health care organizations

# *An evidence-based model for patient safety defenses*

- Errors in health care result from “active failures” and “latent conditions”
- Majority of errors (90%) arise from latent conditions (system failures)
- Fixing latent system conditions is more likely to achieve safety than targeting active failures (provider errors)

A vertical green decorative bar with a curved right edge is located on the left side of the slide.

## *Elements of the “Work Environment”*

- Management practices
- Workforce capability
- Work processes
- Organizational culture

# *Nursing Role in Patient Safety*

- 54 percent of all healthcare providers
  - 2.2 million RNs
  - 700,000 LPNs/LVNs
  - 2.3 million unlicensed nurse assistants
- Surveillance and “rescue” of patient status
- Coordination and integration of care
- Therapeutics, support, and education
- Intercepting errors
- Commission of errors

# *Health Care Delivery System*

- 1980-2000: 17% fewer hospitals, 28% fewer beds
- More acutely ill hospital and nursing home patients
- LOS decreased by 1 ½ days
- Restructured / redesigned care delivery
- Rapid increases in knowledge and technology

# *HCO Blueprint*

## **Management Practices**

- Leadership
- Evidence-based Management

## **Work Processes**

- Fatigue and work hours
- Reduce inefficiencies and unsafe practices

## **Workforce Capability**

- Safe staffing levels
- Knowledge and skill acquisition
- Interdisciplinary collaboration

## **Organizational Culture**

- Culture of safety

# *HCP Blueprint*

## Management Practices:

- Leadership
- Evidence-based Management

## **Workforce Capacity**

- Safe staffing levels
- Knowledge and skill acquisition
- Interdisciplinary collaboration

## **Work and Workspace Design**

- Fatigue and work hours
- Reduce inefficient and unsafe practices

## **Organizational Culture**

- Culture of safety

# *Changes in Hospital Nursing Leadership*

- Chief nursing officer given expanded responsibilities for multiple non-nursing depts. (e.g., radiology, admitting, outpatient) in addition to nursing
- Many no longer have “nursing” in their title (e.g., VP of Nursing changed to VP of Operations or Patient Care)
- No longer a separate Dept. of Nursing; in some, nursing no longer visible on the organization chart
- Decrease in mid-level nursing managers; remaining nurse supervisors responsible for multiple nursing units and non-nursing depts. (e.g., housekeeping)



## *Consequences*

- Potential loss of a voice for nursing
- Weakening of clinical leadership
- Loss of support to staff nurses in solving work problems

***Recommendation: HCOs should acquire nurse leaders for all management levels (e.g., organization-wide and patient care unit levels) who will:***

- participate in executive decisions.
- represent nursing staff to management and facilitate mutual trust.
- achieve effective communication between nursing and other clinical leadership.
- facilitate input of direct-care nursing staff into operational decision making and the design of work.
- be provided with resources to support knowledge acquisition and dissemination to support nurses' clinical decision making.

## *Five Evidence-Based Management Practices*

1. Balance efficiency and reliability
2. Create and sustain trust
3. Actively manage change
4. Involve workers in work design and workflow
5. Create a learning organization

# *Nurse Work Environments - Evidence of:*

- Increased emphasis on efficiency
- Weakened trust
- Poor change management
- Limited nurse involvement in work design and work flow decisions
- Limited use of knowledge management practices

***Recommendation: HCOs should use management processes. . . that:***

- Balance efficiency and safety.
- Demonstrate and promote trust.
- Actively manage change.
- Engage workers in designing work processes and work flow.
- Establish the organization as a “learning organization.”



## ***Recommendation:***

Professional associations, philanthropic organizations, and other health care leaders should sponsor collaboratives to support HCOs in evidence-based management practices.

# *HCO Blueprint*

## **Management Practices**

- Leadership
- Evidence-based management: trust, manage change, involve workers, learning organization, and balance efficiency and reliability

## **Work Processes**

- Fatigue and work hours
- Reduce inefficiencies and unsafe practices

## **Workforce Capability**

- Safe staffing levels
- Knowledge and skill acquisition
- Interdisciplinary collaboration

## **Organizational Culture**

- Culture of safety

# *Safe Staffing Levels*

- Better nurse staffing leads to better patient outcomes
- Hospitals studies generally collect hospital-wide staffing data; less helpful in identifying ideal nursing unit staffing levels
- Nursing home studies have produced better information on ideal staffing

# *“Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes”*

## *Phase II*

- Persistent associations between higher staffing levels and better outcomes along a continuum until a threshold beyond which no detectable benefit from additional staffing
- Incremental improvements in outcomes occurred at all levels below the threshold

## *Potential Responses to the Evidence*

- Regulatory approaches
- Internal staffing practices by HCOs
- Marketplace/consumer-driven approaches

**“Appropriate and coordinated use of all three approaches most conducive to safe staffing”**

***Recommendation: The US Dept. of Health and Human Services should update 1990 regulations that specify minimum nursing home staffing standards to:***

- Require at least one RN within the facility at all times.
- Specify staffing levels that increase as the number of patients increase, based on the DHHS report to Congress, *Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes – Phase II Final Report*.
- Address staffing levels for nurse assistants, who provide the majority of patient care.

***Recommendation: Hospitals and nursing homes should employ nurse staffing practices that:***

- Include admissions, discharges, and “less than full-day” patients in estimates of patient volume.
- Involve direct-care nursing staff in determining and evaluating staffing methods.
- Provide for staffing “elasticity” or “slack” to accommodate unpredicted variations in patient care workload.

## ***Recommended staffing practices:*** (Cont.)

- Approaches to providing slack should give preference to scheduling excess staff and creating cross-trained float pools within the HCO. Use of nurses from external agencies should be avoided.
- Involve direct-care nursing staff in identifying the causes of nursing staff turnover and in developing methods to improve nursing staff retention.
- Empower nursing unit staff to regulate unit work flow and set criteria for unit closures to new admissions and transfers as nursing workload and staffing necessitate.

***Recommendation: Hospitals and nursing homes should perform ongoing evaluation of their nurse staffing practices, and increase oversight whenever staffing falls below:***

- In hospital ICUs—one licensed nurse for every 2 patients.
- In nursing homes, for long-stay residents — one RN for every 32 patients, one licensed nurse for every 18 patients, and one nurse assistant for every 8.5 patients.

***Recommendation: DHHS should implement a nationwide system for collecting and managing reliable staffing data from hospitals and nursing homes.***

- Information on individual hospital and nursing home staffing should be disclosed to the public.
- During the next 3 years, public and private sponsors of the new hospital report card should develop, test, and implement measures of hospital nurse staffing levels for the public.

## *Better Education & Training*

- Increasing complexity of patient care
- < half of hospital nursing administrators find new nurses prepared to deliver safe, effective care
- Newly licensed nurses report similar educational needs
- Limited mechanisms to evaluate competency
- Hospital orientation and CE programs scaled back
- Similar weaknesses in NA education and training

## *Budgetary Commitments to Worker Training*

- 3.2-3.6 % of payroll\* (multi-industry leaders)
- 1.9 % of payroll (average across all industries)
- 1.4 % of payroll (average by HCOs)

n = 270

Source: ASTD, 2001

\* Wages and salaries but not benefits

***Recommendation: HCOs should support nursing staff in ongoing acquisition and maintenance of knowledge and skills:***

- Assign nurse preceptors to nurses newly practicing in a clinical area.
- Annually ensure each nurse and nurse assistant has resources for educational development.
- Provide education and training on new technology or changes in the workplace.
- Provide decision support technology

***Recommendation: HCOs should support interdisciplinary collaboration by:***

- adopting mechanisms such as interdisciplinary rounds, and
- providing ongoing education and training in interdisciplinary collaboration for all health care providers on a regular basis.

# *HCO Blueprint*

## **Management Practices**

- Leadership
- Evidence-based management: trust, manage change, involve workers, learning organization, and balance efficiency and reliability

## **Work Processes**

- **Fatigue and work hours**
- **Reduce inefficiencies and unsafe practices**

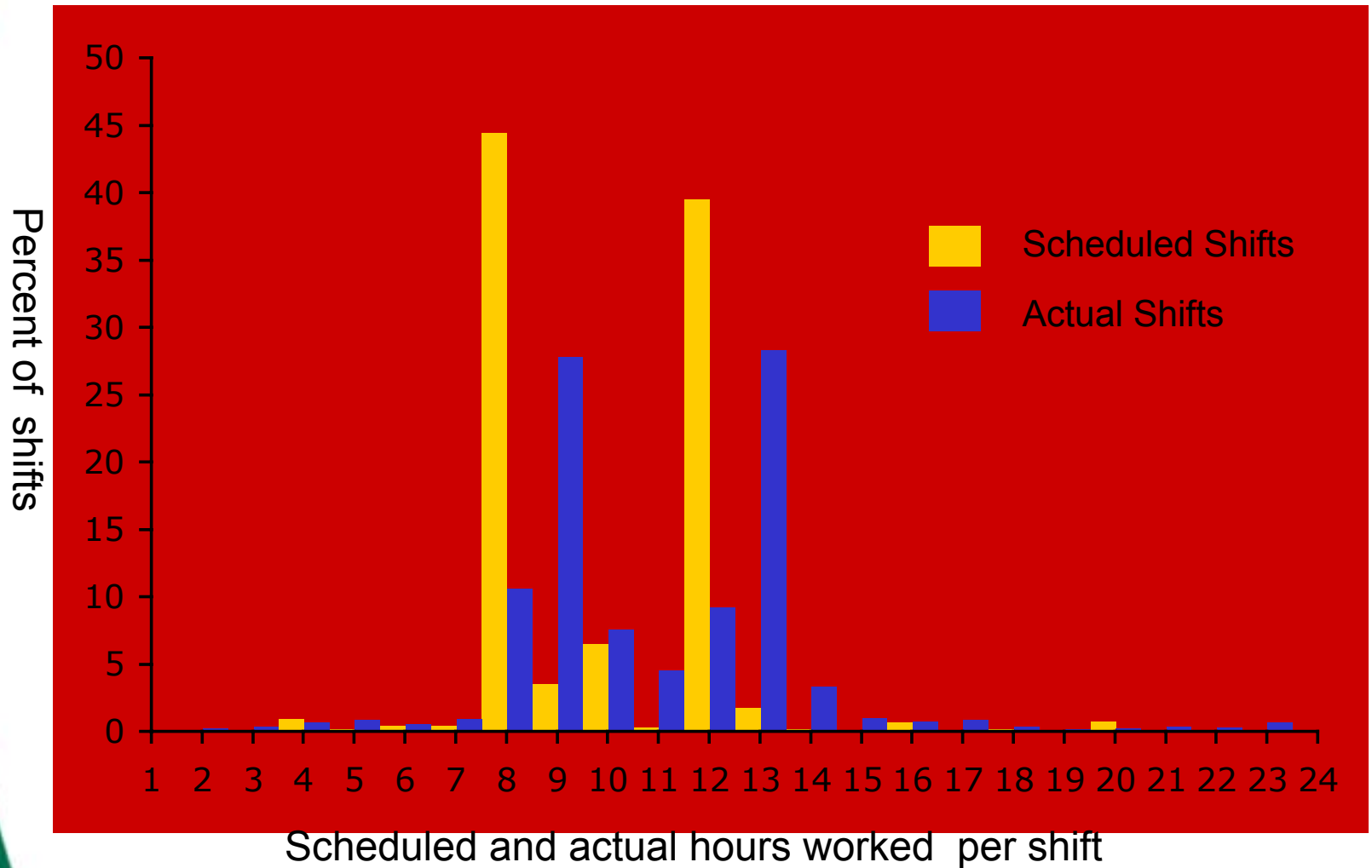
## **Workforce Capability**

- Safe staffing levels
- Knowledge and skill acquisition
- Interdisciplinary collaboration

## **Organizational Culture**

- Culture of safety

# *Scheduled and Actual Shift Durations*



## *Dangers of Long Work Hours*

- 12 hour+ shifts with limited rests: “sustained operations”
- Error rates in nurses increased after 12 hours of work
- Fatigue decreases reaction time, attention to detail, motivation, and problem-solving ability

***Recommendation: States should prohibit nursing staff from providing patient care in excess of 12 hours per day and 60 hours per 7-day period.***

- HCOs and labor organizations should establish policies to prevent nurses from working longer than these hours.
- Schools of nursing, state boards of nursing, and HCOs should educate nurses about the threats to patient safety caused by fatigue.

# *Some work processes inherently dangerous*

## **Medication administration**

- 770,000 annually killed or injured from adverse drug events in hospitals
- in two studies, 34-38% of medication errors occurred during nurse administration of medication
- Remedies: decision support, unit-dose dispensing, bar-coding, smart infusion pumps, et al.

## **Handwashing**

- 80,000 deaths / year from hospital-acquired infections
- most hospital-acquired infections transmitted by hospital workers
- handwashing most effective at decreasing infections
- handwashing rates at 16-81%
- Remedies: decrease workload, use of alcohol-based hand rubs

## *Inefficient work processes contribute to errors*

- Documentation and paperwork 13-28% of hospital nurses' time
- Additional time spent “hunting and gathering” people, supplies, equipment
- Time used to perform non-nursing activities; e.g., housekeeping

**Recommendation: HCOs should provide nursing leadership with resources to design the nursing work environment and care processes to reduce errors, especially those associated with:**

- Surveillance of patient health status.
- Patient transfers and other patient hand-offs.
- Complex patient care processes.
- “Non–value-added” activities performed by nurses, e.g., locating supplies and personnel, completing redundant and unnecessary documentation.



## ***Recommendation:***

HCOs should address handwashing and medication administration among their first work design initiatives.



## ***Recommendation:***

Regulators, leaders in health care, and experts in nursing, law, informatics, and related disciplines should jointly convene to identify strategies for safely reducing the burden associated with patient and work-related documentation.

