



Hospital-acquired Infections in Pennsylvania

In January 2004, Pennsylvania hospitals began submitting data on hospital-acquired infections to the Pennsylvania Health Care Cost Containment Council (PHC4). While concerns remain about whether all hospitals are fully complying with this new initiative, the first year of data collected provides some eye-opening information for all parties involved in the delivery and payment of hospital care. In 2004, hospitals reported 11,668 hospital-acquired infections, that is, 7.5 hospital-acquired infections per 1,000 patients admitted to Pennsylvania's general acute care hospitals. 15.4 percent or 1,793 of these patients died. \$2 billion in additional hospital charges and 205,000 additional hospital days were associated with the hospital admissions in which these devastating infections occurred. However, until all Pennsylvania hospitals have met the current PHC4 reporting requirements for hospital-acquired infection data, the full impact of these infections remains unknown.

PHC4's Call to Action

Early last year, the Pennsylvania Health Care Cost Containment Council (PHC4) began collecting information on infections that patients contract while in the hospital, a groundbreaking step that few states have undertaken. This new initiative, which began January 1, 2004, is in response to growing concern about hospital-acquired infections, which can result in compromised quality of care for the patient, prolonged hospital stays, increased costs, and death. This data collection effort is designed to assist in the effort to reduce the number of these infections by providing current, accurate data to providers, purchasers, and consumers of health care.

The United States has seen an increase in hospital-acquired infections in recent decades. A review published in the *New England Journal of Medicine* cited several studies reporting national estimates. Between 1975 and 1995, the incidence of hospital-acquired infections per 1,000 bed days increased by 36.1 percent. The author noted that "these adverse events affect approximately 2 million patients each year in the United States and result in some 90,000 deaths."

In 2004, there were 1.9 million admissions to Pennsylvania hospitals. This analysis focuses on the 1,562,600 admissions to 173 general acute care hospitals. These hospitals reported 11,668 hospital-acquired infections to PHC4.

Beginning January 1, 2004, hospitals were required to start submitting data to PHC4 on the following types of hospital-acquired infections:

- 1. Surgical site infections for orthopedic surgery, neurosurgery, and surgery related to the circulatory system**
- 2. All device-related infections for:**
 - **Foley catheter-associated urinary tract infection**
 - **Ventilator-associated pneumonia**
 - **Central line-associated bloodstream infection**

As of January 1, 2006 hospitals will be required to submit data on all hospital-acquired infections to PHC4.

Type of Infection	Number of Hospital-acquired Infections Reported by Hospitals
Surgical Site	1,317
Urinary Tract	6,139
Pneumonia	1,335
Bloodstream	1,932
Multiple Infections	945
Total	11,668

Hospital-acquired infections are life threatening.

Of the 11,668 patients with a hospital-acquired infection, 15.4 percent died, compared to a mortality rate of 2.4 percent for patients who did not have a hospital-acquired infection. The difference in mortality rates equated to an *additional* 1,510 deaths for those patients with hospital-acquired infections—446 with bloodstream infections, 423 with urinary tract infections, 393 with pneumonia, and 8 with surgical site infections. The remaining deaths were associated with multiple infections.

Mortality rates were highest, 31.9 percent, for patients reported as having ventilator-associated pneumonia. The mortality rates for patients reported as having central line-associated bloodstream infections and Foley catheter-associated urinary tract infections were 25.6 percent and 9.4 percent respectively, while patients with hospital-acquired surgical site infections had a mortality rate of 3.1 percent.

Hospital admissions related to the 11,668 hospital-acquired infections reported by hospitals for 2004 were associated with an *additional*:

- ✦ 1,510 deaths
- ✦ 205,000 hospital days
- ✦ \$2 billion in hospital charges

Hospital-acquired infections are costly.

The hospital admissions in which patients contracted hospital-acquired infections, as reported to PHC4 for 2004, were associated with more than 205,000 *additional* hospital days and \$2 billion in *additional* hospital charges, when compared to hospitalizations for patients who did not have a hospital-acquired infection.

The average additional length of stay for patients who contracted either a bloodstream infection or pneumonia was about 26 days. Patients with urinary tract infections spent an average of 12.4 additional days in the hospital, while those with surgical site infections spent an average of 7.8 additional days.

Hospital admissions in which patients contracted bloodstream infections amounted to an additional \$609 million in hospital charges. Additional charges for hospitalizations related to patients with Foley catheter-associated urinary tract infections were over \$472 million. Additional charges for hospitalizations related to ventilator-associated pneumonia were over \$427 million. Hospital admissions in which patients contracted surgical site infections were associated with over \$104 million in additional hospital charges. The remaining hospital charges were associated with multiple infections.

Hospital-acquired infections are a grave concern to the purchasers of health care.

Given the persistent increases in health care costs, purchasers of health care, including Pennsylvania businesses and labor organizations, are concerned about their ability to purchase quality care for their employees and members. A look at the payments made by the majority of third-party health insurance carriers in Pennsylvania explains

their concerns. Payment data for 2003 (2004 was not available) were screened for diagnosis codes that may indicate the presence of a hospital-acquired infection (*possible* infection). Table 1 displays the differences in payments, length of stay, and mortality for hospitalizations without an infection and those with a *possible* hospital-acquired infection.

In 2003 the average payment for a hospital admission in which a patient contracted an infection was \$29,320. Assuming that the average payment remained the same for 2004, third party insurance payments for the 11,668 hospital-acquired infections identified by hospitals would amount to over \$342 million.

Hospital-acquired infections were likely underreported for 2004.

Results from the first year of data collection indicate that while some hospitals worked hard to meet the hospital-acquired infection data collection requirements, other hospitals provided minimal information.

There was a steady increase each quarter of 2004 in the number of hospital-acquired infections reported. Yet, submission disparities among

hospitals raised concerns regarding the accuracy and completeness of the reported data.

For the fourth quarter of 2004, there were several notable disparities among hospitals' data submissions. Just 17 percent of the hospitals submitted more than one-half of all the hospital-acquired infections reported. Several large hospitals submitted invalid hospital-acquired infection data for the majority of their discharges. Sixteen hospitals, including several large hospitals, reported no hospital-acquired infections. Although reporting no hospital-acquired infections does not necessarily raise concerns for smaller hospitals (they may not offer complex clinical services such as intensive care and certain surgical procedures), it does raise concerns regarding the reliability of data submitted by large hospitals that routinely provide these services.

One of the major concerns regarding the hospital-acquired infection data collected in 2004 is the discrepancy between the number of hospital-acquired infections reported by hospitals and the number of infections that were billed for by hospitals.

In order to better understand this discrepancy, PHC4 screened the 2004 hospital billing data

for diagnoses that may indicate the presence of a hospital-acquired infection. While not all infections are acquired in the hospital—many patients enter the hospital with certain types of infections—results from this screening process suggest the possibility of more hospital-acquired infections than reported to PHC4. Both the reported and possible hospital-acquired infection numbers

Table 1.
Hospital Admissions Covered by Third-Party Insurance, 2003

Type of Infection	Number	Average Payment	Average Length of Stay in Days	Percent Died
Surgical Site	242	\$24,223	13.1	0.8
Urinary Tract	1,379	\$18,589	9.7	1.9
Pneumonia	948	\$28,691	12.2	5.9
Bloodstream	528	\$40,129	15.4	13.8
Multiple Infections	260	\$71,325	23.9	11.9
Any of the Above Infections	3,357	\$29,320	12.6	5.6
Without an Infection	102,657	\$8,319	3.4	0.7

Table 2.
Number of Reported and Possible Hospital-Acquired Infections, 2004

	Hospital-Acquired Infections (as reported by hospitals)	Possible Hospital-Acquired Infections (as identified through a diagnosis screening process)
Number of Patients with Infections	11,668	115,631*
Number of Infections by Type:		
Surgical Site	1,317	4,132
Urinary Tract	6,139	69,466
Pneumonia	1,335	32,090
Bloodstream	1,932	21,458
Multiple Infections	945	*

* The number of *patients* does not match the number of *infections* because some patients had more than one infection. In those instances each infection was counted once under each type of infection present.

are important because all infections are taxing the health care system.

Table 2 provides information on the number of reported hospital-acquired infections and the number of infections identified through the screening process as *possible* hospital-acquired infections.

Conclusion

The hospital-acquired infection data reported to PHC4 by Pennsylvania general acute care hospitals clearly demonstrate the importance of this new, groundbreaking initiative. Although the number of infections that patients contracted while in the hospital was likely underreported,

the 1,510 additional deaths, 205,000 additional hospital days, and \$2 billion in additional hospital charges for the hospital admissions associated with the hospital-acquired infections reported in 2004 are compelling figures.

Accurate and complete data collection along with dissemination of information to all stakeholders are essential components of health care improvement initiatives. Reducing hospital-acquired infections is imperative to reducing health care costs for consumers, payors, and hospitals themselves and to improving the quality of care and quality of life for patients in Pennsylvania hospitals.



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The Pennsylvania Health Care Cost Containment Council (PHC4) periodically releases *Research Briefs* on health care topics relevant to public policy interest.

PHC4 is an independent state agency created to collect, analyze, and disseminate information designed to improve the quality and restrain the cost of health care.