

Epidemiology & Prevention importance

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Healthcare Associated Infections





CENTERS FOR DISEASE
CONTROL AND PREVENTION

Epidemiology



HAI Estimates Occurring in US Acute Care Hospitals, 2011

Major Site of Infection	Estimated No.
Pneumonia	157,500
Gastrointestinal Illness	123,100
UTI	93,300
Primary BSI	71,900
SSI	157,500
Other types of infections	118,500
Total	721,800

about **75,000** patients with HAIs died during their hospitalizations.
More than half of all HAIs occurred outside of the intensive care unit.

<https://www.cdc.gov/hai/surveillance/>

Epidemiology



Device-associated infections density per 1000 device-day

	NHSN *	INICC **
CLABSI	3.4	4.78
VAP	4.4	14.7
CAUTI	5.0	5.30

* Dudeck MA, Weiner LM, Allen-Bridson K, Malpiedi PJ, Peterson KD, Pollock DA, et al. National Healthcare Safety Network (NHSN) Report, data summary for 2012, device-associated module. Am J Infect Control. 2013; 41:1148-66.

** Rosenthal VD, Maki DG, Mehta Y, Leblebicioglu H, Memish ZA, Al-Mousa HH, et al. International Nosocomial Infection Control Consortium (INICC) report, data summary of 43 countries for 2007-2012. Device-associated module. Am J Infect Control 2014; 42:942-56.

Epidemiology

European CDC:

Approximately **4 100 000** patients are estimated to acquire a healthcare-associated infection in the EU each year.

The number of deaths occurring as a direct consequence of these infections is estimated to be at least **37 000** and these infections are thought to contribute to an additional **110 000** deaths each year.

Epidemiology

- The crude prevalence of residents with at least one HAI in 2013 was 3.4%.
- The total annual number of residents with a HAI in European long-term care facilities in 2013 was estimated at **116 416** residents on any given day, with an estimated total of 4.2 million HAIs for the entire year.
- The percentage of **SSIs** varied by type of operation, with the highest rate (9.7%) reported for colon surgery and the lowest rate (0.5%) for laminectomy.
- 5.3% acquired **pneumonia** in ICUs, which in 92% of the cases was associated with intubation.
- The mean incidence density per ICU was 6.4 pneumonia per 1000 patient-days (ICU IQR: 2.1–9.1)



Epidemiology

Health care-associated infections FACT SHEET:

Of every 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will acquire at least one health care-associated infection.

UTI is the most frequent HAI infection in high-income countries, SSI is the leading infection in settings with limited resources, affecting up to one-third of operated patients; this is up to nine times higher than in developed countries.





Epidemiology

Health care-associated infections FACT SHEET:

in high-income countries, approximately 30% of patients in intensive care units (ICU) are affected by at least one health care-associated infection.

In low- and middle-income countries the frequency of ICU-acquired infection is at least 2-3 fold higher than in high-income countries; device-associated infection densities are up to 13 times higher than in the USA.





Epidemiology

Health care-associated infections FACT SHEET:

Prevalence:

in developed countries between 3.5% and 12%.

5.7% - 19.1% in low- & middle-income countries.





Epidemiology

Impact of HAIs:

- Prolong hospital stay.
- Long-term disability.
- Increase resistance to antimicrobials.
- Massive additional financial burden.
- Cause unnecessary deaths.

Annually account for 37 000 attributable deaths in Europe and 99 000 deaths in the USA.

Annual financial losses approximately €7 billion in Europe about US\$ 6.5 billion in the USA.



Epidemiology



Device-associated infections density per 1000 device-day

	TUMS *	SBUMS **
CLABSI	10.2	5.84
VAP	21	7.88
CAUTI	7.4	8.99

* Afhami Sh et al. Device-associated infections: a multi-center assay using the Iranian Nosocomial Infections Surveillance (INIS) software. In Press

** Jahani-Sherafat S et al. Device-associated infection rates and bacterial resistance in six academic teaching hospitals of Iran. *Journal of Infection and Public Health* (2015) 8, 553—561



Iran Epidemiology

Table 2. Frequency Distribution of Type of Infection by Hospital Ward, Based on Culture Results ^{a,b}

Hospital Ward	Type of Infection				Rates of Number and Percent Infection in Wards Per Total Infections
	Pneumonia	UTI	SSI	BSI	
ICU	23 (14.93)	6 (3.89)	3 (1.95)	1 (0.64)	33 (21.42)
Internal medicine	-	2 (1.29)	-	-	2 (1.29)
General surgery	-	1 (0.64)	3 (1.95)	2 (1.29)	6 (3.89)
orthopedic	1 (0.64)	1 (0.64)	25 (16.23)	7 (4.54)	34 (22.07)
OBGYN	2 (1.29)	-	38 (24.67)	11 (7.14)	51 (33.11)
Infectious diseases	2 (1.29)	1 (0.64)	15 (9.75)	9 (5.84)	27 (17.53)
CCU	-	1 (0.64)	-	-	1 (0.64)
Total	28 (18.18)	12 (7.8)	84 (54.55)	30 (19.48)	154 (100)

^a Abbreviations: BSI, bloodstream infection; SSI, Surgical site infections; UTI, urinary tract infection.

^b Data are presented as No. (%).



Salmanzadeh Sh, Yousefi F, Ahmadi F. Evaluation of Nosocomial Infections in a Teaching Hospital. *Avicenna J Clin Microb Infec.* 2015 August; 2(3): e29760.



CENTERS FOR DISEASE
CONTROL AND PREVENTION

Prevention

importance



**Rates of some targeted HAIs (e.g., CLABSI)
can decrease by **more than 70 percent.****

Preventing HAIs is possible, but it will take a conscious effort of everyone—clinicians, healthcare facilities and systems, public health, quality improvement groups, and the government—working together toward improving care, protecting patients, and saving lives.

<https://www.cdc.gov/hai/surveillance/>



Prevention

importance

European CDC:

Approximately **20–30%** of healthcare-associated infections are considered to be preventable by intensive hygiene and control programmes.

http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/Pages/index.aspx





What are the solutions?

- identifying local determinants of the HCAI burden.
- improving reporting and surveillance systems.
- ensuring minimum requirements in terms of facilities and dedicated resources available for HCAI.
- ensuring that core components for infection control are in place at the national and health-care setting levels.
- implementing standard precautions, particularly best hand hygiene practices at the bedside;
- improving staff education and accountability.
- conducting research to adapt and validate surveillance protocols based on the reality of developing countries;
- conducting research on the potential involvement of patients and their families in HCAI reporting and control.



Thank You

