

# Nosocomial Infections Surveillance System

## I. Foreword

After taking on the Nosocomial Infections Control Project in 2000, the Centers for Disease Control (CDC) realized that by establishing a standard Nosocomial Infections Surveillance System and unifying definitions and formats, hospitals could better track incidents of nosocomial infections. Furthermore, a centralized system can facilitate inter-hospital comparisons and intra-hospital self-evaluation, thereby fostering quality control through friendly competition.

By using the Nosocomial Infections Surveillance System developed by the CDC, hospitals may conduct nosocomial infections case management and generate reports for periodic analysis. Through nosocomial infections data exchange, hospitals can detect any aberrations and handle outbreaks swiftly. This system allows hospitals to better safeguard the wellbeing of healthcare workers and the general public.

## II. Purposes

1. Assistance for hospitals in developing surveillance that permit timely recognition of infection control problems.
2. Discovery of nosocomial infection trends to estimate the magnitude of nosocomial infections and to infer its impact on the health of our citizens.

## III. Nosocomial infection surveillance data content

1. TNIS (Taiwan Nosocomial Infections Surveillance System) hospitals contributing data used in this report.
2. Distribution of infection sites for nosocomial infections.
3. Common pathogens for nosocomial infections in the ICUs of medical centers.
4. Common pathogens for nosocomial infections in the non-ICUs of medical centers.
5. Common pathogens for nosocomial infections in the ICUs of regional hospitals.
6. Common pathogens for nosocomial infections in the non-ICUs of regional hospitals.

#### IV. The usage of the Nosocomial Infections Surveillance System and data feedback

Since October 2001, the CDC has enlisted the ICUs of medical centers to adopt the National Nosocomial Infections Surveillance System (NNIS). From March 2002, the Department of Health-Affiliated General Hospitals was also enrolled in the system. In June 2002, application for using the system became open to all regional hospitals.

To enhance the utility and efficiency of Nosocomial Infections Surveillance System, CDC has revised the system and renamed it Taiwan Nosocomial Infections Surveillance System (TNIS). The infection data of medical centers were collected during the initial phase, others hospitals are going to gather in the successive phase. In April 2007, CDC has requested the enlisted hospitals to finalize data for ensuring the data quality on the nosocomial infection of TNIS data from 2003-2006, for the difference of formats and definitions between the NNIS and TNIS. Because of the incomplete and ongoing data collections now, this report should be considered provisional (table 15). After finalizing data, CDC is going to update previously published data on its websites for the general public's information. As a result, the nosocomial infection situations at hospitals could be compared within its level.

For site-specific nosocomial infections in the entire ICUs of medical centers, urinary tract infections topped the list (40.5%), followed by bloodstream infections (26.0%), and respiratory tract infections (16.9%) (Table16). Site-specific nosocomial infections in the non-ICUs, with urinary tract infection topping the list (43.7%), followed by bloodstream infections (28.1%), and surgical site infections (10.9%). The top three pathogens for infections among the ICUs of medical centers were: *Pseudomonas aeruginosa*, *Escherichia coli*, and *Acinetobacter baumannii* (Table17); the top three pathogens for nosocomial infections in the non-ICUs were: *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa* (Table18).

For regional hospitals, urinary tract infections were the number one site-specific infections in the ICUs (39.5%), followed by respiratory tract infections (25.3%), and bloodstream infections (23.8%). Site-specific infections in non-ICUs, urinary tract infections also came up on top (43.0%), followed by bloodstream infections (22.9%), and respiratory tract infections (18.1%). The top three pathogens for the ICUs were *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Acinetobacter baumannii* (Table19). The top three pathogens for the non-ICUs were: *Escherichia coli*, *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae* (Table20).

V. Nosocomial Infections data from medical centers and regional hospitals:  
Surveillance System Data Analysis for 2006

Table 15. TNIS hospitals contributing data used in this report

Hospital type	1 <sup>st</sup> Quarter			2 <sup>nd</sup> Quarter			3 <sup>rd</sup> Quarter			4 <sup>th</sup> Quarter		
	No. of hospitals	Infection person-times		No. of hospitals	Infection person-times		No. of hospitals	Infection person-times		No. of hospitals	Infection person-times	
		ICU	Non-ICU		ICU	Non-ICU		ICU	Non-ICU		ICU	Non-ICU
Medical center	14	1,376	2,402	11	1,156	2,002	11	949	1,738	9	1,077	1,718
Regional hospital	56	1,365	2,233	46	1,030	1,924	39	810	1,838	38	724	1,798

Note: Data updated to 2007/07/31

Table 16 Site-specific nosocomial infections

Infection site	Medical centers		Regional hospitals	
	ICU % (N)	Non-ICU % (N)	ICU % (N)	Non-ICU % (N)
Urinary tract	40.5 (1,846)	43.7 (3,437)	39.5 (1,553)	43.0 (3,352)
Bloodstream	26.0 (1,187)	28.1 (2,209)	23.8 (936)	22.9 (1,787)
Respiratory tract	16.9 (771)	9.8 (770)	25.3 (994)	18.1 (1,411)
Surgical site	5.7 (259)	10.9 (855)	4.0 (158)	8.6 (670)
Others	10.9 (495)	7.5 (589)	7.3 (288)	7.4 (573)
Total	100.0 (4,558)	100.0 (7,860)	100.0 (3,929)	100.0 (7,793)

Table 17 Common pathogens for nosocomial infections in the ICUs of medical centers

Pathogens	Infection sites											
	Total		Urinary tract		Bloodstream		Respiratory tract		Surgical site		Others	
	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank
<i>Pseudomonas aeruginosa</i>	537	1	176	2	88	4	193	1	40	1	40	2
<i>Escherichia coli</i>	470	2	319	1	77	5	24	6	30	3	20	7
<i>Acinetobacter baumannii</i>	412	3	75	7	115	2	156	2	27	4	39	3
<i>Klebsiella pneumoniae</i>	386	4	151	4	101	3	90	3	22	5	22	5
<i>Staphylococcus aureus</i>	382	5	14	14	164	1	94	4	41	2	69	1
<i>Candida albicans</i>	199	6	162	3	34	9	-	-	-	-	3	20
<i>Enterobacter cloacae</i>	135	7	46	8	32	10	19	8	16	7	22	4
Yeast-like	129	8	108	5	6	31	7	15	2	29	6	14
<i>Enterococcus faecium</i>	125	9	75	6	30	12	-	-	10	9	10	9
<i>Stenotrophomonas maltophilia</i>	122	10	8	19	45	7	55	5	5	16	9	12

Note: “-“ indicates rank > 35<sup>th</sup>.

Table 18 Common pathogens for nosocomial infections in the non-ICUs of medical centers

Pathogens	Infection sites											
	Total		Urinary tract		Bloodstream		Respiratory tract		Surgical site		Others	
	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank
<i>Escherichia coli</i>	1,326	1	889	1	271	2	42	5	91	2	33	5
<i>Staphylococcus aureus</i>	829	2	67	11	359	1	91	3	191	1	121	1
<i>Pseudomonas aeruginosa</i>	771	3	385	2	119	5	144	1	77	3	46	2
<i>Klebsiella pneumoniae</i>	752	4	333	3	229	3	107	2	56	5	27	6
<i>Acinetobacter baumannii</i>	445	5	146	6	139	4	87	4	33	8	40	4
<i>Enterococcus faecalis</i>	322	6	177	4	68	8	-	-	64	4	13	8
<i>Enterobacter cloacae</i>	249	7	83	10	91	6	26	9	35	7	14	7
<i>Candida albicans</i>	198	8	155	5	31	11	-	-	-	-	7	14
<i>Proteus mirabilis</i>	189	9	137	7	13	24	16	10	17	14	6	16
Coagulase negative staphylococci	173	10	8	20	83	7	-	-	37	6	44	3

Note: “-“ indicates rank > 35<sup>th</sup>.

Table 19 Common pathogens for nosocomial infections in the ICUs of regional hospitals

Pathogens	Total		Infection sites									
			Urinary tract		Bloodstream		Respiratory tract		Surgical site		Others	
	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank
<i>Pseudomonas aeruginosa</i>	446	1	137	3	50	4	214	1	20	1	25	3
<i>Klebsiella pneumoniae</i>	380	2	144	2	74	2	126	3	17	2	19	4
<i>Acinetobacter baumannii</i>	352	3	63	4	71	3	164	2	15	4	39	1
<i>Escherichia coli</i>	351	4	246	1	46	5	40	5	8	6	11	5
<i>Staphylococcus aureus</i>	308	5	12	15	130	1	116	4	17	3	33	2
<i>Enterobacter cloacae</i>	93	6	28	9	36	6	20	8	4	10	5	11
<i>Proteus mirabilis</i>	91	7	53	5	9	16	20	7	5	7	4	14
<i>Enterococcus spp.</i>	88	8	48	6	23	9	-	-	9	5	8	6
<i>Candida albicans</i>	71	9	37	7	14	14	14	10	4	11	2	20
<i>Serratia marcescens</i>	65	10	14	12	24	8	16	9	5	8	6	9

Note: “-“ indicates rank > 35<sup>th</sup>.

Table 20 Common pathogens for nosocomial infections in the non-ICUs of regional hospitals

Pathogens	Total		Infection sites									
			Urinary tract		Bloodstream		Respiratory tract		Surgical site		Others	
	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank
<i>Escherichia coli</i>	1,037	1	664	1	189	2	76	5	74	2	34	4
<i>Pseudomonas aeruginosa</i>	740	2	331	2	80	6	234	1	48	3	47	2
<i>Klebsiella pneumoniae</i>	706	3	315	3	170	3	163	2	22	5	36	3
<i>Staphylococcus aureus</i>	669	4	73	7	244	1	113	4	142	1	89	1
<i>Acinetobacter baumannii</i>	400	5	140	5	93	4	125	3	17	6	25	5
<i>Proteus mirabilis</i>	275	6	188	4	28	11	25	8	16	7	18	6
<i>Enterobacter cloacae</i>	196	7	46	10	85	5	27	7	32	4	6	9
<i>Enterococcus spp.</i>	155	8	97	6	27	12	-	-	15	8	13	8
<i>Serratia marcescens</i>	146	9	52	9	37	8	45	6	7	13	5	11
<i>Candida albicans</i>	105	10	67	8	12	13	23	11	-	-	3	13

Note: “-“ indicates rank > 35<sup>th</sup>.