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## MORBIDITY AND MORTALITY WEEKLY REPORT

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Current Trends

### Infection Surveillance and Control Programs in U.S. Hospitals: An Assessment, 1976

In the past decade growing concern over hospital-acquired, or nosocomial, infections (1) with their resulting morbidity, mortality, and economic consequences has stimulated considerable investment by U.S. hospitals in a variety of activities aimed at infection surveillance and control. To enumerate these approaches and to determine ultimately which, if any, reduce infection risks most effectively for the least cost, CDC began designing early in 1974 a multi-phased nationwide study, termed the Study on the Efficacy of Nosocomial Infection Control, or SENIC Project.

In March 1976, CDC, together with the National Center for Health Statistics, began the first of SENIC's 3 phases with the mailing of a Preliminary Screening Questionnaire (PSQ) to the approximately 7,000 general hospitals in the United States. The PSQ was designed to measure the extent of infection surveillance and control program (ISCP) activities and their chronological development. All data collected in the study were obtained with a guarantee that they would be held in strict confidence, would be used only for the purposes stated for this study, and would not be released to others without consent of the individual or establishment giving the response. At the close of the survey in June 1976, 3,543 (86%) hospitals in the main target group of short-term, general hospitals with  $\geq 50$  beds had replied. The responses from this group of hospitals are summarized in this initial report.

Questions in the survey pertained both to hospitals' current practices in early 1976 and to the development of their practices over the previous decade (1965 through the first half of 1976). While the PSQ covered a variety of practices, some recommended and others not recommended, this report will focus on profiles of 4 areas: infection control staff, surveillance, environmental culturing, and active control.

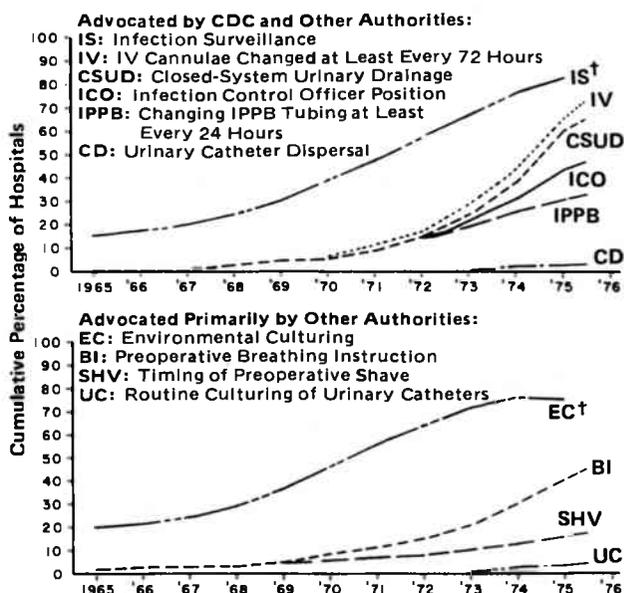
#### INFECTION CONTROL STAFF

Among the hospitals responding to questions about their infection control staff, 64% reported having a physician or microbiologist supervising ISCP activities. Eighty-nine percent of these supervisors were physicians, and 14% were infectious disease specialists. Almost one-third of the super-

visors had taken a special training course in hospital epidemiology, about half at CDC. Two percent reported having extended training in public health or epidemiology. About two-thirds of the supervisors spent between 1 and 5 hours per week on infection control. Nine percent received a salary for these activities.

Forty-two percent of the respondents reported having an infection control officer (ICO), such as an infection control nurse or a surveillance officer, who spent  $\geq 20$  hours per week on ISCP activities. The percentage of hospitals with such a position has increased markedly since 1970 (Figure 1). About 80% of the ICOs had attended a special training course in hospital epidemiology, 80% of these at CDC. Over three-fourths of the ICOs spent more than half their time conducting surveillance.

**FIGURE 1. Adoption of an infection control officer position, surveillance, environmental culturing, and 7 patient-care policies, in target U.S. hospitals,\* 1965-76\*\***



\* 3,543 short-term general hospitals with  $\geq 50$  beds  
 \*\* Responses covered only the first quarter to first half of 1976  
 † Data collected through 1975 only

## SURVEILLANCE

Surveillance of nosocomial infections has increased steadily in the past decade (Figure 1). At the time of the PSQ survey, surveillance was being practiced by 83% of the respondents, whereas 16% did so in 1965 and 40% in 1970. Although recall bias may be partially responsible for the low levels reported in earlier years, it seems likely that there has been a true marked increase in the number of surveillance programs as well as in their intensity. Of those hospitals conducting surveillance, three-fourths reported active case-finding techniques, such as making ward rounds, reviewing bacteriologic cultures and investigating those patients with potential nosocomial infections, contacting physicians and nurses for reports of infection, and reviewing fever charts on the hospital wards. About half reported more passive techniques, such as having physicians and nurses fill out and submit infection report forms and having the infection control staff review charts retrospectively. Eighteen percent of those conducting surveillance attempted routinely to follow up patients for the appearance of nosocomial infections after discharge.

The majority of respondents used CDC-recommended approaches for defining infections and tabulating and reviewing their surveillance data. Eighty-three percent used written definitions for infection; 66% tabulated infection percentage rates; 80% tabulated specific infection rates by site, service, or pathogen; and 75% reviewed their surveillance data at least monthly.

## ENVIRONMENTAL CULTURING

Culturing of the inanimate environment was conducted by 20% of the responding hospitals in 1965, 46% in 1970, and 75% in 1975 — down slightly from the peak level of 76% in 1974 (Figure 1). By 1975 over 20% of the hospitals reported a reduction in the quantity of culturing, as recommended by the American Hospital Association (AHA) (2) and CDC, while by comparison fewer than 5% had reduced infection surveillance. One-fourth of the hospitals reported that they performed environmental culturing in 1975 primarily to elucidate specific infection problems under investigation, whereas the remaining 75% performed such culturing routinely. The latter were also much more likely to be performing extensive culturing.

## ACTIVE CONTROL ACTIVITIES

Included in the category of active control activities are data on in-service education, the authority of the infection control staff, and available sources of information as well as hospital policies on 7 specific patient-care practices. In general, in-service education on infection control was performed by in-service education departments; in 25% of the hospitals teaching was done primarily by the infection control staff. Eleven percent of respondents used mainly surveillance data collected in their own hospital for teaching, 22% used scientific articles only, and 40% used a combination of these.

(Continued on page 145)

Table I. Summary—Cases of Specified Notifiable Diseases: United States

(Cumulative totals include revised and delayed reports through previous weeks)

DISEASE	16th ..... WEEK ENDING		MEDIAN 1973-1977 ††	CUMULATIVE, FIRST 16 WEEKS		
	April 22, 1978	April 23, 1977 †		April 22, 1978	April 23, 1977 †	MEDIAN 1973-1977 ††
Aseptic meningitis	43	28	31	567	559	559
Brucellosis	1	4	4	35	49	48
Chickenpox	5,431	6,488	5,797	65,523	99,457	90,662
Diphtheria	2	4	6	27	28	75
Encephalitis	Primary	14	8	13	168	236
	Post-Infectious	4	7	7	40	67
Hepatitis, Viral	Type B	290	318	245	4,496	4,936
	Type A	618	634	721	8,536	10,182
	Type unspecified	165	137	7	2,645	2,768
Malaria	5	4	7	126	108	85
Measles (rubeola)	1,043	2,249	1,143	9,825	25,492	13,096
Meningococcal infections, total	63	58	39	893	721	549
Civilian	63	58	38	882	717	533
Military	—	—	1	11	4	13
Mumps	603	588	1,275	6,769	9,624	25,303
Pertussis	36	16	—	625	222	—
Rubella (German measles)	885	873	869	5,146	9,915	6,624
Tetanus	2	2	2	17	15	15
Tuberculosis	635	569	689	8,593	8,869	9,292
Tularemia	2	4	1	21	28	28
Typhoid fever	3	5	5	123	108	101
Typhus, tick-borne (Rky. Mt. spotted fever)	2	3	3	16	33	20
Venereal Diseases:						
Gonorrhea	Civilian	19,974	16,771	17,387	281,918	282,670
	Military	451	754	577	7,195	8,365
Syphilis, primary and secondary	Civilian	411	364	497	6,288	6,571
	Military	5	6	6	92	94
Rabies in animals	75	72	67	808	804	804

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax: N.C. 1	1	Poliomyelitis, total:	—
Botulism: N. Max. 34, Ore. 1	39	Paralytic:	—
Congenital rubella syndrome*	9	Psittacosis: Iowa 3, Oka 1, Tex. 2, Ariz. 2, Calif. 1	39
Leprosy: Tex. 2, Calif. 3	32	Rabies in man:	—
Leptospirosis:	11	Trichinosis: Mich. 1, Iowa 1	9
Plague:	1	Typhus, murine:	10

†Delayed reports received for calendar year 1977 are used to update last year's weekly and cumulative totals.

††Medians for Gonorrhea and Syphilis are based on data for 1975-1977

\*Delayed reports: Cong. rubella syndrome: Mass. 3 (1977)

Table III  
Cases of Specified Notifiable Diseases: United States  
Weeks Ending April 22, 1978 and April 23, 1977 - 16th Week

AREA REPORTING	ASEPTIC MENIN- GITIS	BRUCEL- LOSIS	CHICKEN- POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS, VIRAL			MALARIA	
						Primary: Arthropod- borne and Unspecified		Post In- fectious	Type B	Type A	Type Unspecified		
						1978	1977 <sup>†</sup>	1978	1978	1978	1978		
UNITED STATES .....	43	1	5,431	2	27	14	8	4	290	618	165	5	126
NEW ENGLAND .....	2	-	344	-	-	-	-	-	13	22	11	1	7
Maine .....	-	-	55	-	-	-	-	-	1	3	-	-	1
New Hampshire* .....	1	-	5	-	-	-	-	-	-	-	-	-	1
Vermont .....	-	-	3	-	-	-	-	-	-	2	-	-	-
Massachusetts* .....	1	-	141	-	-	-	-	-	1	3	11	-	1
Rhode Island .....	-	-	33	-	-	-	-	-	1	1	-	-	-
Connecticut* .....	-	-	107	-	-	-	-	-	10	13	-	1	4
MIDDLE ATLANTIC .....	6	-	562	-	-	3	1	1	51	45	20	1	33
Upstate New York .....	2	-	410	-	-	-	-	-	25	26	6	-	4
New York City .....	4	-	55	-	-	2	-	-	12	8	3	1	15
New Jersey* .....	-	-	NN	-	-	-	1	-	14	11	11	-	4
Pennsylvania .....	-	-	97	-	-	1	-	1	NA	NA	NA	-	10
EAST NORTH CENTRAL ..	3	-	2,338	-	-	-	4	1	26	108	6	-	4
Ohio .....	-	-	243	-	-	-	1	1	9	36	-	-	-
Indiana* .....	-	-	406	-	-	-	-	-	4	2	4	-	-
Illinois .....	-	-	748	-	-	-	-	-	4	49	1	-	2
Michigan .....	1	-	452	-	-	-	2	-	6	12	1	-	1
Wisconsin .....	2	-	489	-	-	-	1	-	3	9	-	-	1
WEST NORTH CENTRAL ..	2	-	702	-	-	-	-	-	8	37	5	-	10
Minnesota .....	-	-	1	-	-	-	-	-	2	11	1	-	2
Iowa .....	-	-	267	-	-	-	-	-	2	1	2	-	-
Missouri* .....	2	-	12	-	-	-	-	-	2	21	1	-	4
North Dakota .....	-	-	1	-	-	-	-	-	-	3	-	-	-
South Dakota .....	-	-	3	-	-	-	-	-	-	-	-	-	-
Nebraska .....	-	-	54	-	-	-	-	-	1	1	-	-	3
Kansas .....	-	-	364	-	-	-	-	-	1	-	1	-	1
SOUTH ATLANTIC .....	8	-	659	-	-	-	-	1	48	66	20	1	21
Delaware .....	-	-	1	-	-	-	-	-	-	-	-	-	1
Maryland .....	2	-	1	-	-	-	-	-	10	-	1	1	7
District of Columbia ..	-	-	1	-	-	-	-	-	7	-	3	-	-
Virginia* .....	-	-	49	-	-	-	-	-	10	5	4	-	4
West Virginia .....	1	-	266	-	-	-	-	-	1	6	-	-	1
North Carolina .....	1	-	NN	-	-	-	-	-	2	2	1	-	-
South Carolina .....	1	-	8	-	-	-	-	-	-	3	-	-	1
Georgia .....	-	-	-	-	-	-	-	-	5	13	-	-	1
Florida* .....	3	-	333	-	-	-	-	1	13	37	11	-	6
EAST SOUTH CENTRAL ..	1	-	28	-	-	1	-	-	17	39	13	-	2
Kentucky .....	-	-	8	-	-	1	-	-	7	22	10	-	1
Tennessee .....	1	-	NN	-	-	-	-	-	9	14	2	-	1
Alabama .....	-	-	7	-	-	-	-	-	-	-	1	-	-
Mississippi .....	-	-	13	-	-	-	-	-	1	3	-	-	-
WEST SOUTH CENTRAL ..	3	1	322	-	1	3	-	1	31	81	25	-	7
Arkansas .....	-	-	5	-	1	2	-	-	1	3	6	-	-
Louisiana .....	-	-	NN	-	-	-	-	-	9	21	9	-	3
Oklahoma .....	2	-	-	-	-	1	-	1	7	13	5	-	-
Texas* .....	1	1	317	-	-	-	-	-	14	44	5	-	4
MOUNTAIN .....	-	-	147	1	2	-	-	-	13	90	20	-	3
Montana .....	-	-	16	-	-	-	-	-	-	1	1	-	-
Idaho .....	-	-	16	-	-	-	-	-	-	8	-	-	-
Wyoming .....	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado .....	-	-	102	1	1	-	-	-	6	8	5	-	1
New Mexico .....	-	-	5	-	-	-	-	-	1	23	1	-	-
Arizona .....	-	-	NN	-	-	-	-	-	3	40	8	-	1
Utah .....	-	-	3	-	-	-	-	-	2	8	5	-	-
Nevada .....	-	-	5	-	1	-	-	-	1	2	-	-	1
PACIFIC .....	18	-	329	1	24	7	3	-	83	130	45	2	39
Washington .....	2	-	302	1	24	-	1	-	7	17	6	-	1
Oregon .....	-	-	1	-	-	-	-	-	23	38	7	-	2
California* .....	11	-	-	-	-	6	2	-	51	66	31	2	34
Alaska .....	-	-	-	-	-	1	-	-	2	8	1	-	-
Hawaii .....	5	-	26	-	-	-	-	-	-	1	-	-	2
Guam* .....	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-
Puerto Rico* .....	-	-	5	-	-	-	-	-	-	3	2	-	2
Virgin Islands .....	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-

NN: Not notifiable

NA: Not available

†Delayed reports received for 1977 are not shown below but are used to update last year's weekly and cumulative totals.

\*The following delayed reports will be reflected in next week's cumulative totals: Asep. mang.: Fla. +1; Chickenpox: Mass. +1, Conn. +9, Mo. +299, Calif. +10, Guam +9, P.R. +4; Enceph.: Ind. +1; Hep. B.: N.H. +1, Fla. +1, Tex. +1; Hep. A: N.H. -1, N.J. -1, Mo. -4, Va. -2; Hep. unsp.: N.H. +1, Mo. -3, Va. -1, Fla. -1, Tex. -1, Guam +3.

**Table III-Continued**  
**Cases of Specified Notifiable Diseases: United States**  
*Weeks Ending April 22, 1978 and April 23, 1977 - 16th Week*

REPORTING AREA	MEASLES (Rubeola)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1978	CUMULATIVE		1978	CUMULATIVE		1978	CUM. 1978	1978	1978	CUM. 1978	CUM. 1978
		1978	1977 †		1978	1977 †						
UNITED STATES .....	1,043	9,825	25,492	63	893	721	603	6,769	36	885	5,146	17
NEW ENGLAND .....	109	1,039	1,264	3	46	36	14	432	-	35	257	-
Maine* .....	43	650	3	-	4	2	8	317	-	4	105	-
New Hampshire .....	-	10	378	-	6	3	1	6	-	18	62	-
Vermont .....	7	12	236	1	2	3	-	3	-	-	-	-
Massachusetts* .....	14	123	300	1	12	10	2	41	-	3	51	-
Rhode Island .....	-	4	6	1	11	-	1	11	-	-	1	-
Connecticut* .....	45	240	341	-	11	18	2	54	-	10	38	-
MIDDLE ATLANTIC .....	108	773	3,337	14	133	91	14	281	9	111	964	-
Upstate New York .....	86	528	998	7	48	24	5	92	4	17	118	-
New York City .....	8	96	144	-	30	18	5	80	5	-	25	-
New Jersey .....	-	10	76	5	26	23	1	54	-	71	659	-
Pennsylvania .....	14	139	2,119	2	29	26	3	55	-	23	162	-
EAST NORTH CENTRAL .....	306	3,549	5,633	7	78	76	215	2,379	5	554	1,963	1
Ohio .....	14	208	323	4	20	29	36	266	4	261	335	-
Indiana .....	13	69	2,768	2	15	7	2	115	-	8	90	1
Illinois .....	8	349	597	-	4	15	106	799	-	50	143	-
Michigan .....	176	2,259	585	-	31	17	38	746	-	109	865	-
Wisconsin .....	95	664	1,360	1	8	8	33	453	2	126	530	-
WEST NORTH CENTRAL .....	21	122	4,849	-	32	41	47	1,279	-	8	152	1
Minnesota .....	-	12	921	-	4	18	-	11	-	-	10	-
Iowa .....	-	10	2,512	-	5	4	2	88	-	2	18	-
Missouri* .....	-	6	568	-	16	13	32	735	-	2	41	-
North Dakota* .....	20	57	6	-	-	1	-	5	-	-	9	-
South Dakota .....	-	-	10	-	2	4	-	5	-	-	16	-
Nebraska .....	-	1	85	-	-	-	-	10	-	-	4	-
Kansas .....	1	36	747	-	5	1	13	425	-	4	54	1
SOUTH ATLANTIC .....	338	2,461	1,436	17	242	151	17	343	4	54	503	2
Delaware .....	1	5	19	-	3	2	-	22	-	-	5	-
Maryland .....	-	1	128	3	11	11	3	43	-	-	2	1
District of Columbia .....	-	-	2	-	1	-	-	-	-	-	1	-
Virginia* .....	251	1,708	831	2	35	9	3	55	1	29	173	-
West Virginia .....	67	440	63	-	5	8	2	74	1	18	150	-
North Carolina .....	3	49	26	2	48	40	2	37	1	5	103	-
South Carolina .....	13	148	115	-	17	12	1	11	-	2	7	-
Georgia .....	-	5	223	1	30	26	-	12	-	-	1	-
Florida* .....	3	105	29	9	92	43	6	89	1	-	61	1
EAST SOUTH CENTRAL .....	31	710	620	6	73	77	32	499	11	30	158	1
Kentucky .....	1	58	169	1	14	19	3	81	9	4	39	1
Tennessee .....	29	517	381	1	21	20	21	250	2	2	76	-
Alabama .....	-	25	55	4	21	25	8	152	-	-	4	-
Mississippi .....	1	110	15	-	17	13	-	16	-	24	39	-
WEST SOUTH CENTRAL .....	99	686	1,453	5	129	152	246	1,043	2	54	453	10
Arkansas .....	-	3	26	-	13	9	219	439	1	2	56	1
Louisiana .....	58	317	56	3	43	63	-	37	-	43	238	1
Oklahoma .....	1	9	45	1	11	4	-	4	1	-	8	1
Texas .....	40	357	1,326	1	62	76	27	563	-	9	151	7
MOUNTAIN .....	8	106	1,669	3	16	15	-	111	3	4	78	-
Montana .....	4	76	828	-	1	2	-	7	2	-	8	-
Idaho .....	-	1	28	-	1	1	-	17	-	-	3	-
Wyoming .....	-	-	1	-	-	1	-	-	-	-	-	-
Colorado .....	-	12	355	-	2	1	-	32	-	-	17	-
New Mexico .....	-	-	199	-	2	3	-	7	1	1	3	-
Arizona .....	-	7	185	2	5	6	-	3	-	2	28	-
Utah .....	3	4	5	1	4	-	-	43	-	1	17	-
Nevada .....	1	6	68	-	1	1	-	2	-	-	2	-
PACIFIC .....	23	379	5,231	8	144	82	18	402	1	35	619	2
Washington .....	1	37	301	2	23	11	5	112	-	14	72	-
Oregon .....	9	108	121	-	4	8	-	37	-	2	46	-
California .....	13	228	4,748	6	111	47	12	235	1	19	498	2
Alaska .....	-	1	55	-	5	15	-	4	-	-	1	-
Hawaii .....	-	5	6	-	1	1	1	14	-	-	1	-
Guam .....	NA	1	3	-	-	-	NA	1	NA	NA	-	-
Puerto Rico* .....	5	75	409	-	1	-	33	479	-	-	10	1
Virgin Islands .....	NA	6	9	-	-	-	NA	1	NA	NA	1	-

NA: Not available

†Delayed reports received for 1977 are not shown below but are used to update last year's weekly and cumulative totals.

\*The following delayed reports will be reflected in next week's cumulative totals: Measles: Maine +2, N. Dak. +10, Va. -1, P.R. +3; Men. Inf.: Va. -3; Mumps, Mass -1, Mo. +81, P.R. +30; Pertussis: Mo. -1, Rubella: Conn. -10, Mo. +2, Va. -1, Fla. -3.

Table III-Continued  
 Cases of Specified Notifiable Diseases: United States  
 Weeks Ending April 22, 1978 and April 23, 1977 - 16th Week

REPORTING AREA	TUBERCULOSIS		TULA-REMIA	TYPHOID FEVER		TYPHUS-FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only)						RABIES IN ANIMALS	
	1978	CUM. 1978	CUM. 1978	1978	CUM. 1978	1978	CUM. 1978	GONORRHEA		SYPHILIS (Pri. & Sec.)		1978	CUMULATIVE		CUM. 1978
								1978	1977 †	1978	CUMULATIVE				
											1978		1977 †		
UNITED STATES	635	8,593	21	3	123	2	16	19,974	281,918	282,670	411	6,288	6,571	808	
NEW ENGLAND	20	290	-	-	31	-	-	479	7,075	7,425	16	199	244	36	
Maine*	-	17	-	-	-	-	-	38	538	592	-	3	7	34	
New Hampshire	-	8	-	-	5	-	-	25	334	285	-	1	1	-	
Vermont	-	11	-	-	-	-	-	9	176	186	-	-	4	-	
Massachusetts	11	172	-	-	17	-	-	168	3,114	3,279	12	135	182	1	
Rhode Island	1	17	-	-	4	-	-	42	492	551	-	6	3	-	
Connecticut	8	65	-	-	5	-	-	197	2,421	2,532	4	54	47	1	
MIDDLE ATLANTIC	73	1,478	1	-	13	-	5	2,459	31,373	31,169	71	859	957	16	
Upstate New York	12	216	1	-	3	-	3	298	5,013	4,547	1	52	85	16	
New York City	26	579	-	-	7	-	-	741	12,341	13,728	56	612	600	-	
New Jersey	22	382	-	-	1	-	-	948	5,965	4,882	6	95	128	-	
Pennsylvania	13	301	-	-	2	-	2	472	8,054	8,012	8	100	144	-	
EAST NORTH CENTRAL	135	1,256	-	-	6	-	-	2,704	39,895	41,991	26	601	737	27	
Ohio	31	235	-	-	1	-	-	772	10,665	10,596	10	134	185	3	
Indiana	13	163	-	-	-	-	-	447	4,438	3,681	6	38	51	3	
Illinois	43	446	-	-	1	-	-	792	11,769	14,157	6	355	394	1	
Michigan*	46	357	-	-	4	-	-	562	9,363	9,510	2	55	75	-	
Wisconsin	2	55	-	-	-	-	-	131	3,660	4,047	2	19	32	20	
WEST NORTH CENTRAL	35	297	7	2	7	1	1	932	13,799	14,602	18	156	149	209	
Minnesota	4	58	-	-	1	-	-	131	2,495	2,612	13	69	48	74	
Iowa	6	38	-	-	2	-	-	114	1,657	1,802	1	13	11	44	
Missouri	22	118	6	-	2	-	-	461	5,477	6,097	2	38	53	25	
North Dakota	1	16	-	-	-	-	-	8	297	252	-	2	2	31	
South Dakota	-	31	-	-	-	-	-	31	520	400	-	1	1	25	
Nebraska	-	3	-	-	-	-	-	35	1,042	1,160	1	4	16	1	
Kansas	2	33	1	2	2	1	1	152	2,311	2,279	1	29	18	9	
SOUTH ATLANTIC	129	1,891	2	-	11	-	6	5,232	68,268	67,953	116	1,696	1,915	80	
Delaware	-	12	-	-	-	-	-	64	1,059	843	-	3	13	1	
Maryland	21	332	2	-	1	-	-	588	8,996	8,451	17	131	127	-	
District of Columbia	13	105	-	-	-	-	1	332	4,483	4,705	6	137	210	-	
Virginia	6	206	-	-	3	-	-	391	6,236	7,150	10	154	190	1	
West Virginia	4	70	-	-	-	-	-	69	1,068	920	-	5	1	-	
North Carolina*	16	305	-	-	-	-	2	955	9,561	10,019	8	144	281	1	
South Carolina	10	153	-	-	-	-	2	394	6,397	6,299	9	79	82	8	
Georgia	17	232	-	-	2	-	1	1,141	12,909	13,299	27	410	351	59	
Florida*	42	476	-	-	5	-	-	1,298	17,559	16,267	39	633	660	10	
EAST SOUTH CENTRAL	48	829	4	-	1	-	1	1,492	23,973	24,679	25	307	209	45	
Kentucky	12	184	1	-	1	-	-	230	2,726	3,366	3	36	21	29	
Tennessee	15	251	3	-	-	-	1	543	8,792	9,877	10	118	62	9	
Alabama	10	197	-	-	-	-	-	441	7,188	6,933	6	44	42	7	
Mississippi	11	197	-	-	-	-	-	278	5,267	4,503	6	109	84	-	
WEST SOUTH CENTRAL	69	948	5	1	7	1	2	2,726	39,585	36,570	60	946	827	249	
Arkansas	7	102	4	-	-	-	-	168	3,028	2,813	1	32	20	38	
Louisiana	20	186	1	-	-	-	-	505	6,493	5,145	3	178	183	5	
Oklahoma	4	110	-	-	-	-	-	270	3,548	3,363	1	34	19	64	
Texas	38	550	-	1	7	1	2	1,783	26,516	25,249	55	702	605	142	
MOUNTAIN	12	242	1	-	9	-	-	619	10,428	11,568	10	126	129	6	
Montana	-	19	-	-	-	-	-	46	661	584	-	6	-	-	
Idaho	-	10	1	-	5	-	-	28	358	563	-	1	3	-	
Wyoming	-	4	-	-	-	-	-	9	246	308	-	3	2	-	
Colorado	-	12	-	-	2	-	-	159	2,842	2,981	1	39	40	-	
New Mexico	1	46	-	-	-	-	-	53	1,440	1,711	5	36	24	5	
Arizona	11	120	-	-	-	-	-	157	2,652	3,271	4	27	51	1	
Utah	-	9	-	-	1	-	-	15	624	693	-	3	4	-	
Nevada	-	22	-	-	1	-	-	152	1,605	1,457	-	11	5	-	
PACIFIC	114	1,362	1	-	38	-	1	3,331	47,522	46,713	69	1,398	1,404	140	
Washington	NA	34	-	-	1	-	-	278	3,432	3,448	NA	49	54	-	
Oregon	2	56	-	-	1	-	-	172	3,281	3,509	5	46	45	1	
California	101	1,062	1	-	36	-	1	2,701	38,357	37,268	63	1,283	1,286	137	
Alaska	-	16	-	-	-	-	-	76	1,511	1,493	-	5	6	2	
Hawaii	11	194	-	-	-	-	-	84	941	995	1	15	13	-	
Guam*	NA	24	-	NA	-	NA	-	NA	48	90	NA	-	1	-	
Puerto Rico	6	131	-	-	-	-	-	46	804	967	9	135	194	7	
Virgin Islands	NA	1	-	NA	-	NA	-	NA	59	48	NA	4	1	-	

NA: Not available

†Delayed reports received for 1977 are not shown below but are used to update last year's weekly and cumulative totals.

\*The following delayed reports will be reflected in next week's cumulative totals: TB: Mich. -1, N.C. -4, Fla. -2; GC: Guam +1; Syphilis: Fla. -1; An. rabies: Maine +1

**Table IV**  
**Deaths in 121 United States Cities\***  
*Week Ending April 22, 1978 - 16th Week*

REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES	REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES
	ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year			ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year	
<b>NEW ENGLAND</b>	672	430	177	34	19	41	<b>SOUTH ATLANTIC</b>	1,172	667	344	72	38	50
Boston, Mass.	178	93	61	12	8	11	Atlanta, Ga.	155	75	46	15	7	1
Bridgeport, Conn.	42	25	12	2	2	-	Baltimore, Md.	187	106	59	10	2	4
Cambridge, Mass.	25	17	7	1	-	1	Charlotte, N. C.	65	29	24	7	3	4
Fall River, Mass.	30	22	6	1	-	-	Jacksonville, Fla.	74	50	17	4	-	2
Hartford, Conn.	60	37	19	2	-	2	Miami, Fla.	139	80	43	6	7	12
Lowell, Mass.	33	22	6	1	3	2	Norfolk, Va.	57	31	16	2	4	6
Lynn, Mass.	20	16	2	-	2	-	Richmond, Va.	89	40	35	6	4	3
New Bedford, Mass.	25	22	3	-	-	-	Savannah, Ga.	43	23	15	2	2	3
New Haven, Conn.	45	27	15	3	-	1	St. Petersburg, Fla.	101	81	14	3	1	4
Providence, R.I.	68	44	21	2	1	10	Tampa, Fla.	83	49	22	6	2	3
Somerville, Mass.	8	5	3	-	-	-	Washington, D. C.	131	76	38	8	5	7
Springfield, Mass.	50	36	10	2	1	4	Wilmington, Del.	48	27	15	3	1	1
Waterbury, Conn.	44	34	5	3	-	7							
Worcester, Mass.	44	30	7	5	2	3							
<b>MIDDLE ATLANTIC</b>	2,680	1,692	684	156	76	127	<b>EAST SOUTH CENTRAL</b>	743	414	211	67	24	29
Albany, N. Y.	60	40	15	1	3	2	Birmingham, Ala.	131	75	32	18	1	3
Allentown, Pa.	22	14	8	-	-	1	Chattanooga, Tenn.	57	38	15	2	-	6
Buffalo, N. Y.	99	67	22	3	4	9	Knoxville, Tenn.	47	35	9	-	2	2
Camden, N. J.	29	16	11	1	1	1	Louisville, Ky.	117	63	40	9	1	6
Elizabeth, N. J.	27	16	9	1	-	2	Memphis, Tenn.	148	86	42	10	4	3
Erie, Pa.	31	22	5	1	2	-	Mobile, Ala.	72	33	20	7	10	-
Jersey City, N. J.	49	35	9	2	2	-	Montgomery, Ala.	62	31	20	5	2	5
Newark, N. J.	74	37	24	12	-	4	Nashville, Tenn.	109	53	33	16	4	4
New York City, N. Y.	1,354	861	336	85	41	54	<b>WEST SOUTH CENTRAL</b>	1,200	621	348	108	45	34
Paterson, N. J.	34	20	7	4	3	1	Austin, Tex.	54	32	14	5	-	2
Philadelphia, Pa.	393	235	114	24	10	17	Baton Rouge, La.	34	19	8	3	3	4
Pittsburgh, Pa.	123	63	40	8	6	8	Corpus Christi, Tex.	67	37	15	5	7	2
Reading, Pa.	38	27	9	2	-	6	Dallas, Tex.	173	88	59	17	2	4
Rochester, N. Y.	107	73	23	6	-	15	El Paso, Tex.	58	30	17	4	4	2
Schenectady, N. Y.	28	18	4	1	-	1	Fort Worth, Tex.	75	35	23	9	2	3
Scranton, Pa.	43	32	11	-	-	1	Houston, Tex.	276	129	82	28	14	2
Syracuse, N. Y.	92	61	19	2	3	2	Little Rock, Ark.	67	35	18	7	2	1
Trenton, N. J.	37	24	11	2	-	1	New Orleans, La.	143	77	46	9	4	1
Utica, N. Y.	14	11	2	-	1	1	San Antonio, Tex.	128	77	31	12	3	4
Yonkers, N. Y.	26	20	5	1	-	1	Shreveport, La.	55	31	12	3	3	3
							Tulsa, Okla.	70	31	23	6	1	6
<b>EAST NORTH CENTRAL</b>	2,199	1,288	609	147	81	57	<b>MOUNTAIN</b>	528	341	118	28	17	30
Akron, Ohio	75	52	16	2	3	2	Albuquerque, N. Mex.	51	33	10	4	1	6
Canton, Ohio	30	18	7	2	1	3	Colorado Springs, Colo.	27	15	8	1	2	6
Chicago, Ill.	516	286	146	37	18	11	Denver, Colo.	135	84	32	8	6	6
Cincinnati, Ohio	137	78	39	9	6	4	Las Vegas, Nev.	32	17	11	2	-	2
Cleveland, Ohio	178	95	58	16	5	2	Ogden, Utah	24	19	3	-	1	2
Columbus, Ohio	128	70	42	8	3	6	Phoenix, Ariz.	127	79	30	8	4	5
Dayton, Ohio	84	52	24	4	3	1	Pueblo, Colo.	18	13	2	1	-	2
Detroit, Mich.	279	147	85	28	15	4	Salt Lake City, Utah	42	27	12	-	-	1
Evansville, Ind.	40	31	7	1	-	1	Tucson, Ariz.	72	54	10	4	3	-
Fort Wayne, Ind.	35	20	12	-	2	1							
Gary, Ind.	26	15	8	1	1	2	<b>PACIFIC</b>	1,594	993	397	94	57	38
Grand Rapids, Mich.	57	36	13	3	3	2	Berkeley, Calif.	23	14	3	2	1	2
Indianapolis, Ind.	141	81	40	12	5	1	Fresno, Calif.	71	45	14	4	7	1
Madison, Wis.	34	25	3	1	4	3	Glendale, Calif.	22	18	3	-	1	1
Milwaukee, Wis.	127	85	29	6	-	1	Honolulu, Hawaii	54	28	20	4	1	1
Peoria, Ill.	38	23	11	3	-	1	Long Beach, Calif.	107	67	24	7	7	4
Rockford, Ill.	50	35	13	1	1	4	Los Angeles, Calif.	442	289	101	23	10	12
South Bend, Ind.	41	29	8	2	2	1	Oakland, Calif.	67	36	18	3	5	3
Toledo, Ohio	119	76	30	5	7	6	Pasadena, Calif.	20	14	5	1	-	3
Youngstown, Ohio	64	34	18	6	2	2	Portland, Oreg.	123	74	35	9	2	-
							Sacramento, Calif.	80	46	21	4	6	1
<b>WEST NORTH CENTRAL</b>	784	520	166	41	31	44	San Diego, Calif.	129	80	35	12	1	1
Des Moines, Iowa	59	38	13	6	-	1	San Francisco, Calif.	170	107	36	12	7	1
Duluth, Minn.	23	16	4	-	1	2	San Jose, Calif.	39	26	9	3	-	1
Kansas City, Kans.	38	23	10	4	1	3	Seattle, Wash.	156	93	47	7	5	9
Kansas City, Mo.	123	73	29	10	6	6	Spokane, Wash.	47	28	16	1	1	-
Lincoln, Nebr.	34	25	8	-	-	3	Tacoma, Wash.	44	28	10	2	3	2
Minneapolis, Minn.	113	76	25	3	5	6							
Omaha, Nebr.	81	55	18	4	2	7							
St. Louis, Mo.	156	91	37	11	13	2	<b>TOTAL</b>	11,572	6,966	3,054	747	388	450
St. Paul, Minn.	69	57	5	1	2	5	Expected Number	11,265	6,914	2,904	685	415	436
Wichita, Kans.	88	66	17	2	1	9							

\*By place of occurrence and week of filing certificate. Excludes fetal deaths.

The Morbidity and Mortality Weekly Report, circulation 78,000, is published by the Center for Disease Control, Atlanta, Georgia. The data in this report are provisional, based on weekly telegrams to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

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*Infection Surveillance — continued*

In about half of the hospitals, the infection control staff were authorized to close a unit or ward because of infection hazards, whereas in about three-fourths they had the authority to isolate an infectious patient.

Of the various publications and manuals specifically related to hospital epidemiology, the most commonly available in hospitals were the AHA's *Infection Control in the Hospital* (88%) and CDC's *Isolation Techniques for Use in Hospitals* (83%). The American Public Health Association's *Control of Communicable Diseases in Man* and the *MMWR* were available in about 50% of the hospitals.

A number of practices, termed preventive patient-care practices, have been recommended to reduce infection risks among hospitalized patients. The chronological establishment of hospital policies on 7 of these practices — 4 advocated by CDC and other authorities and 3 advocated primarily by others — is shown in Figure 1. By 1975, most hospitals had adopted policies on changing intravenous cannulae at least every 72 hours and on maintaining closed-system urinary drainage; somewhat less than half had adopted policies on giving preoperative breathing instruction to surgical patients, on changing patients' respirator tubing at least every 24 hours, and on limiting the timing of the preoperative shave to no more than 1 hour before surgery; almost no hospitals had undertaken routine culturing of urinary catheters or arranging patients' room assignments to avoid having 2 patients with urinary catheters sharing a room (i.e., spatial dispersal).

Hospitals with these policies (Figure 1) were further asked whether the infection control staff had participated in their formulation. Based on these percentages, it appears that the infection control staff had considerable influence in establishing policies on changing respirator tubing (55%), administering preoperative breathing instruction (31%), and limiting the timing of the preoperative shave (47%), and had even greater influence in establishing those on closed-system urinary drainage (80%), spatial dispersal of patients with indwelling urinary catheters (76%), routine culturing

of indwelling urinary catheters (86%), and regular schedules for changing intravenous cannulae (71%).

*Reported by Dept of Biostatistics, School of Public Health, University of North Carolina at Chapel Hill; National Center for Health Statistics; Bacterial Diseases Div, Bur of Epidemiology, CDC.*

**Editorial Note:** This survey demonstrates a marked increase in the number and scope of hospitals' ISCPs in the relatively brief span of time since 1970, when less than 5-10% of hospitals had appreciable ISCP activity. Furthermore, this movement on the part of hospitals has been largely voluntary, since before this survey few formal standards or regulations mandating certain ISCP activities had been established. Soon after this survey, however, the Joint Commission on Accreditation of Hospitals published a new set of extensive ISCP guidelines (3), which, coupled with the already rising momentum among hospitals, have very likely led to even more extensive programs.

Despite these developments, there unfortunately are little scientifically valid data with which to evaluate the efficacy and cost-effectiveness of the various ISCP approaches being adopted (4) — information potentially important in containing the costs of hospitalization nationwide. Consequently, Phases II and III of the SENIC Project have been designed to provide an intensive on-site study of these different approaches in a statistically representative sample of hospitals, selected in part on the basis of their responses to the PSQ. In these hospitals a detailed measure of ISCP activities will be related to specific patient-care practices and to changes in the nosocomial infection rate between 1970 and 1976 to demonstrate which ISCP approaches have been the most effective for the least cost.

*References*

1. *MMWR* 26:377, 1977
2. American Hospital Association: Statement on Microbiologic Sampling in the Hospital. *J Am Hosp Assoc* 48:125-126, 1974
3. Joint Commission on Accreditation of Hospitals: Accreditation Manual for Hospitals. 3rd ed. Chicago, JCAH, 1976
4. Eickhoff TC: Nosocomial infections. *Am J Epidemiol* 101:93-97, 1975

*Epidemiologic Notes and Reports***Follow-up on Botulism—New Mexico**

Two additional cases of botulism have been reported in New Mexico, bringing the total to 34 cases associated with the outbreak in Clovis (7). Both of the new patients had eaten potato salad prepared at the country club restaurant on April 12.

All 34 patients were initially hospitalized, with 11 requiring mechanical ventilation. Presently 15 remain hospitalized, 8 on ventilators. There have been no deaths.

There is no additional information concerning the source

of the contamination of the 2 incriminated foods — potato salad and 3-bean salad — served at the salad bar.

*Reported by MJ Burkhart, MPH, GS Goldstein, PhD, JM Mann, MD, State Epidemiologist, J Thompson, MPH, New Mexico Dept of Health and Social Services; Enterobacteriology Br, Bacteriology Div, Bur of Laboratories, Field Services Div, and Enteric Diseases Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.*

*Reference*

1. *MMWR* 27:138, 1978

**Tuberculosis — California**

Two recent reports from California re-emphasize that persons living in the United States who have come from countries where tuberculosis is prevalent may have increased risk of tuberculous infection and disease.

In March 1977, a 16-year-old female, who had entered the country from Mexico 6 months earlier, was admitted to a university medical center in southern California with

anorexia of 3 months' duration and a 1-week history of productive cough, chest pain, chills, and fever. Admission chest X ray revealed bilateral upper lobe cavitory disease, and sputa were positive by smear and culture for *Mycobacterium tuberculosis*. She was placed on isoniazid (INH), ethambutol, and rifampin, with satisfactory response, and was discharged from the hospital 2½ weeks later to be fol-

lowed by the Orange County Public Health and Medical Services.

The department investigated contacts as soon as it was notified of her admission. High-risk contacts included her large immediate family, close relatives, neighbors, and schoolmates. Tuberculosis skin tests were performed and repeated 10-15 weeks later on those who were initially negative. Of 21 close contacts identified in her neighborhood and immediate family, 13 were skin-test positive, 6 were negative, and 2 were not read. Of 82 schoolmates also investigated, 38 had positive skin tests, and INH was prescribed for 20. Chest X rays were obtained on school contacts with positive skin tests and also on those with negative skin tests but considered to be at high risk. Aerosol-induced sputum examinations were completed on 4 patients with radiologic abnormalities compatible with tuberculosis.

Clinical pulmonary tuberculosis was diagnosed in 2 schoolmates, and a third case of miliary and meningeal tuberculosis developed in a 2-year-old cousin of the index patient for whom she had cared. This child was initially studied elsewhere, and when her first skin test was negative she was not placed on INH. In connection with these 3 cases found in contacts to the index patient, 31 additional contacts were investigated, 8 of whom were tuberculin reactors. Altogether, a total of 116 close contacts of the 4 cases were offered INH prophylaxis.

The second report concerned the Lassen County Health Department which, in cooperation with the Lassen Junior College Health Service, skin-tested 87 of its 89 foreign-born students in December after learning of 2 recent tuberculin converters among the teachers. None of the students was a case. However 64 (74%) were considered positive: 30 of 46 (65%) from Micronesia, 19 of 26 (73%) from Iran, 6 of 6 from Japan, 5 of 5 from Saudi Arabia, 2 of 4 from Hong Kong, and 1 person each from Cambodia and Mexico. Attempts to determine if foreign students had a past history of BCG vaccination were unsuccessful.

Two of the students with positive skin tests had a past history of tuberculosis. One reported receiving treatment for 1 month and the other for 5. Chest X rays were taken on 62 of the 64 positive students. Based on X-ray findings, 5 (8%) dormitory students—including the 2 students with previously diagnosed tuberculosis—were placed on INH for 1 year. In addition, 13 students with positive skin tests who reported that their previous tests had been negative were started on INH. Sputa were obtained from 2 students; both were negative on smear and culture. Because 13 of the 18

students placed on INH lived in the dormitory, the remaining 62 (U.S.-born) dormitory students, employees, and frequent visitors were skin-tested. Of these, 4 (6%) were positive. It could not be determined whether they were recent converters.

The administration at Lassen Junior College has started a new policy requiring entering foreign-born students to have a tuberculosis skin test before registration, to be followed by an X ray, where indicated. Of 13 newly registered foreign-born students tested in the new semester (February 1978), 9 were skin-test positive. Nineteen new residents of the dormitory, all U.S.-born, were negative.

*Reported by P Engle, MD, Orange County Public Health and Medical Services; L Wobbe, RN, College Health Services, Lassen Junior College; C DeLaHunt, PHN, B Samelson, PHN, Lassen County Health Dept; and HA Renteln, MD, California Dept of Health, in California Morbidity Weekly Report, No. 6, February 17, 1978, and No. 11, March 24, 1978.*

**Editorial Note:** In California and certain other areas of the United States which receive large numbers of immigrants and foreign students, tuberculous infection and disease are being increasingly recognized in persons from places where tuberculosis is still highly prevalent (1). Such persons may enter the United States with latent tuberculosis or tuberculous infections which later lead to progressive disease.

Tuberculosis should always be considered in the differential diagnosis of chest disease, especially in immigrants or students from high-prevalence areas. Large families, crowded living conditions, and delay in seeking or making a diagnosis enhance the risk of transmission. At highest risk are children who are close contacts of bacteriologically positive patients. Even if such children's initial tuberculin tests are negative, they should receive preventive therapy with INH for 3 months and then be re-evaluated.

Tuberculosis in a college residential unit can result in the exposure of a large number of susceptible adolescents and young adults. International students have been recognized as a special risk group in the college environment for whom tuberculosis screening and prevention activities are recommended (2).

*Reported by the Tuberculosis Control Div, Bur of State Services, CDC.*

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1. Tepper L: Tuberculosis in immigrants. California Morbidity Weekly Report, No. 41, October 1977.
2. American College Health Association and American Lung Association: Guidelines for tuberculosis control in colleges. J Am Coll Health Assoc 23:243-245, 1975

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