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MORBIDITY AND MORTALITY WEEKLY REPORT

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Epidemiologic Notes and Reports

Viral Hemorrhagic Fever — Sudan and Zaire

Two outbreaks of hemorrhagic fever caused by a Marburg-like virus occurred in the Sudan and Zaire from August to November 1976. The initial epidemiologic investigations and emergency control measures were carried out by Sudanese and Zairian health personnel, several of whom died in the course of their duties. In view of the unusual gravity of the outbreaks and the unknown nature of the agent, assistance was provided by a World Health Organization (WHO) team in the Sudan and a multinational team in Zaire. Excerpts from the report of an international meeting on the outbreaks are presented below.

The Outbreaks: The outbreak in the Sudan was localized in the townships of Nzara and Maridi (Figure 1). In Nzara, the outbreak lasted from August 15 to September 15 and caused 70 cases, 33 of them fatal. One patient was evacuated from Nzara to Maridi hospital where he died on August 17. The epidemic in Maridi, which was at first thought to be typhoid or another enteric fever, grew suddenly about mid-September and caused 229 cases, 117 of them fatal. Seventy-six members of the staff of 230 in Maridi hospital were infected, and 41 died. Four cases were evacuated

from Maridi to the regional hospital in Juba and caused 1 nosocomial case. One case from Nzara and 1 from Maridi were evacuated to a hospital in Khartoum where they died before it was known that the outbreak was caused by a Marburg-like virus; there were no secondary cases. The last death in the Sudan occurred on November 22.

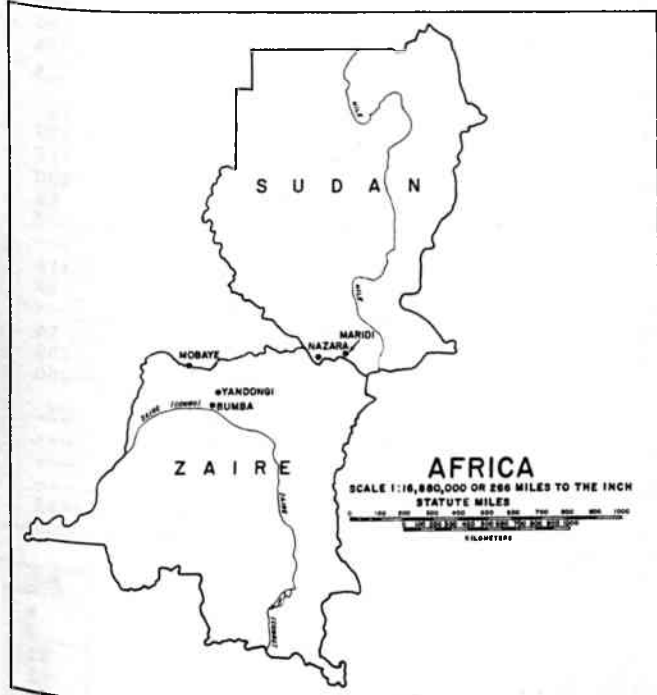
In Zaire, the outbreak occurred in the Bumba and Mobaye zones near Yandongi village. The first case was recorded at Yambuku on September 5, and the peak of the epidemic was reached at the end of that month. At least 43 villages located within 50 km of Yambuku were involved in the epidemic. After reevaluation of all reports to eliminate duplicate recordings, the number of cases totaled 237 including 211 deaths. The last death occurred on November 5. As in the Sudan, disease spread among close personal contacts of patients and hospital staff.

During laboratory investigations of the virus, a worker at the Microbiological Research Establishment in Porton Down, England, pricked his finger through his protective gloves on November 5. He became ill 5 days later, exhibiting the classical symptoms of the first days of the disease, and developed a rash 7-11 days after onset. Marburg-like virus was isolated from his blood on the fourth and seventh days after he pricked his finger (1 day before onset and the third day after onset). He recovered after treatment with immune plasma and interferon.

Clinical Features: The incubation period ranged from 4 to 16 days with a mean of 7 days. During the first 2 days, patients had fever and complained of frontal and occipital headache with weakness, arthralgia of the large joints, and pain in cervical and lumbar musculature. Gastrointestinal symptoms developed after about 2 days (range 0-9 days) in most cases (96%), and diarrhea was most common on the fifth day when patients reported to the hospital. Vomiting was also common as well as oral dryness, pharyngitis, chest pain, dry cough, and agitation. Rash appeared on the fifth day but was sometimes difficult to see. Patients who subsequently died developed bleeding tendencies on the fifth day from multiple sites, but some loss of blood was common even in mild cases. Death occurred between the fourth and tenth day. Abortion and massive metrorrhagia were frequent in pregnant women. Recovery was slow with a persistent complete loss of appetite. Patients were treated symptomatically, with emphasis on rehydration and maintenance of the electrolyte balance.

Epidemiologic Features: The disease occurred in all age groups, with a predominance in adults, and in both sexes,

FIGURE 1. Location of outbreaks of viral hemorrhagic fever, Sudan and Zaire, 1976



with a predominance in males in the Sudan. The attack rate in the Sudan varied from 3.5 per 1,000 in Nzara to 15.3 per 1,000 in Maridi, and in Zaire from 8 per 1,000 in Yandongi to less than 1 per 1,000 in neighboring communities. These data indicate that the disease was not as highly transmissible as thought at first.

Transmission of the disease from person to person required extremely close contact. Infection resulted from contact with blood or body fluids with a high virus concentration, especially those containing blood. Entry was thought to have occurred through skin abrasions or mucous membranes. Transmission through droplets seemed unlikely, some persons having shared the same room with patients without becoming infected, but this mode could not be ruled out. Nursing, either at home or in a hospital, was by far the most common means of contact. Syringes insufficiently sterilized may have played an important role. No biting insect could be incriminated.

The secondary attack rate in Zaire was about 15%. In the Sudan secondary spread was 13%, tertiary spread 14%, and quaternary spread 9%. Transmission seemed to stop spontaneously after 4 generations, but in exceptional circumstances at least 8 generations were documented.

The disease was strongly suspected to be a zoonosis. Monkeys did not seem to play a role in these epidemics, but rodents or bats may have been the animal reservoir. The simultaneous appearance of the disease in 2 regions 1,500 km apart remains unexplained.

Laboratory Investigations: The virus grew on Vero cells

in tissue culture and was infectious for guinea pigs but not for baby mice. Blood specimens collected as early as the second day or as late as the thirteenth day were positive. Reciprocal indirect fluorescent antibody tests at CDC showed that the virus had no antigenic relationship to the strains of Marburg virus isolated in the Federal Republic of Germany and Yugoslavia in 1967 or to those isolated in South Africa in 1975.

Containment Measures: As soon as the high potential for person-to-person transmission was recognized, Sudanese and Zairian epidemiologists recommended that nursing staff be trained in isolation techniques, proper use of protective clothing (especially its removal), and disinfection of patients' excreta. Protective clothing consisted of gowns, caps, masks, gloves, and overshoes or boots. The efficacy of protective clothing was demonstrated when its shortage caused a recrudescence of cases in the Maridi hospital. Disposable material was used whenever available. Non-disposable clothing and instruments were immediately boiled or plunged into disinfectant before washing. A 10% hypochlorite solution of a reliable concentrate was used as a disinfectant. A bath was used to boil clothes, and a petrol drum made an improvised incinerator. Corpses were wrapped in sheets treated with disinfectant and immediately buried to avoid contact with community residents. Those handling corpses wore protective clothing.

Reported by the World Health Organization in the Weekly Epidemiological Record 52:177-180, 1977.

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

[Cumulative totals include revised and delayed reports through previous weeks]

| DISEASE | 25th WEEK ENDING | | MEDIAN 1972-1976 | CUMULATIVE, FIRST 25 WEEKS | | |
|---|------------------|------------------|---------------------|----------------------------|------------------|---------------------|
| | June 25, 1977 | June 26, 1976 | | June 25, 1977 | June 26, 1976 | MEDIAN 1972-1976 |
| Asaptic meningitis | 90 | 55 | 55 | 995 | 921 | 937 |
| Brucellosis | 7 | 6 | 6 | 92 | 124 | 80 |
| Chickenpox | 4,294 | 3,246 | --- | 148,437 | 138,393 | --- |
| Diphtheria | 3 | 5 | 2 | 49 | 112 | 112 |
| Encephalitis | Primary | 18 | 33 | 302 | 377 | 409 |
| | Post-Infectious | 5 | 12 | 9 | 101 | 146 |
| Hepatitis, Viral | Type B | 314 | 251 | 191 | 7,760 | 6,993 |
| | Type A | 548 | 595 | 762 | 15,234 | 16,961 |
| | Type unspecified | 160 | 160 | --- | 4,431 | 4,222 |
| Malaria | 18 | 6 | 6 | 200 | 171 | 137 |
| Measles (rubeola) | 1,294 | 1,158 | 723 | 47,996 | 31,110 | 21,939 |
| Meningococcal infections, total | | 14 | 26 | 26 | 1,026 | 888 |
| | Civilian | 14 | 26 | 26 | 1,021 | 876 |
| | Military | --- | --- | --- | 5 | 12 |
| Mumps | 477 | 571 | 1,118 | 13,911 | 29,408 | 41,468 |
| Pertussis | 13 | 19 | --- | 347 | 455 | --- |
| Rubella (German measles) | 472 | 242 | 290 | 16,698 | 9,691 | 8,316 |
| Tetanus | 1 | --- | 1 | 24 | 20 | 33 |
| Tuberculosis | 700 | 697 | --- | 14,671 | 15,868 | --- |
| Tularemia | 3 | 3 | 3 | 50 | 62 | 54 |
| Typhoid fever | 5 | 5 | 6 | 171 | 155 | 155 |
| Typhus, tick-borne (Rky. Mt. spotted fever) | 48 | 37 | 38 | 376 | 250 | 250 |
| Veneral Diseases: | | | | | | |
| Gonorrhea | Civilian | 20,219 | 19,498 | --- | 450,460 | 463,329 |
| | Military | 475 | 343 | --- | 12,695 | 13,853 |
| Syphilis, primary and secondary | Civilian | 391 | 462 | --- | 9,961 | 11,949 |
| | Military | 4 | 14 | --- | 143 | 167 |
| Rabies in animals | 52 | 57 | 72 | 1,352 | 1,316 | 1,445 |

Table II. Notifiable Diseases of Low Frequency: United States

| | CUM. | | CUM. |
|---|------|------------------------|------|
| Anthrax: | --- | Poliomyelitis, total: | 4 |
| Botulism: | 68 | Paralytic: | 4 |
| Congenital rubella syndrome: | 8 | Psittacosis: | 31 |
| Leprosy: NYC 1, Va. 1, Fla. 1, Cal. 2, Hawaii 1 | 59 | Rabies in man: | 1 |
| Leptospirosis: | 24 | Trichinosis: Tex. 1 | 50 |
| Plague: * N. Mex. 1 | 3 | Typhus, murine: Tex. 2 | 32 |

*Delayed reports: Botulism: Idaho 1, Plague: N. Mex. 1

Table III
Cases of Specified Notifiable Diseases: United States
Weeks Ending June 25, 1977 and June 26, 1976 - 25th 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 | | |
| | | | | | | 1877 | 1876 | 1877 | 1877 | 1877 | 1877 | | |
| UNITED STATES | 90 | 7 | 4,294 | 3 | 49 | 18 | 33 | 5 | 314 | 548 | 160 | 18 | 200 |
| NEW ENGLAND | 2 | 1 | 470 | - | - | - | 1 | - | 12 | 11 | 9 | - | 8 |
| Maine | - | - | 5 | - | - | - | - | - | 1 | 2 | - | - | - |
| New Hampshire | - | - | 14 | - | - | - | - | - | - | - | - | - | - |
| Vermont | - | - | 4 | - | - | - | - | - | - | - | 1 | - | 1 |
| Massachusetts | 1 | 1 | 284 | - | - | - | - | - | 3 | 2 | 7 | - | 2 |
| Rhode Island | 1 | - | 50 | - | - | - | - | - | 3 | 1 | - | - | 2 |
| Connecticut | - | - | 113 | - | - | - | 1 | - | 5 | 6 | 1 | - | 3 |
| MIDDLE ATLANTIC | 13 | - | 1,596 | - | 5 | 5 | 1 | - | 77 | 91 | 28 | 7 | 52 |
| Upstate New York | 3 | - | 1,374 | - | - | 2 | 1 | - | 19 | 16 | 3 | 3 | 14 |
| New York City | - | - | 172 | - | 5 | - | - | - | 17 | 15 | 5 | 3 | 24 |
| New Jersey | 9 | - | NN | - | - | 3 | - | - | 26 | 29 | 20 | - | 6 |
| Pennsylvania | 1 | - | 50 | - | - | - | - | - | 15 | 31 | - | 1 | 8 |
| EAST NORTH CENTRAL | 4 | - | 1,335 | - | - | 2 | 3 | - | 36 | 99 | 10 | 1 | 12 |
| Ohio* | - | - | 89 | - | - | 1 | 1 | - | 12 | 25 | - | - | 6 |
| Indiana | 1 | - | 44 | - | - | - | - | - | 5 | 5 | 7 | - | - |
| Illinois | - | - | 457 | - | - | - | 1 | - | 4 | 24 | - | - | 1 |
| Michigan | 3 | - | 560 | - | - | 1 | 1 | - | 12 | 37 | 3 | 1 | 3 |
| Wisconsin* | - | - | 185 | - | - | - | - | - | 3 | 8 | - | - | 2 |
| WEST NORTH CENTRAL | 4 | - | 152 | - | 1 | 1 | - | - | 18 | 34 | 1 | 1 | 16 |
| Minnesota | - | - | 2 | - | - | - | - | - | 6 | 12 | - | - | 4 |
| Iowa | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| Missouri | - | - | 76 | - | 1 | 1 | - | - | 5 | 8 | - | - | 8 |
| North Dakota | - | - | 6 | - | - | - | - | - | - | 2 | - | - | - |
| South Dakota | - | - | 2 | - | - | - | - | - | 1 | - | - | - | 1 |
| Nebraska | 1 | - | 3 | - | - | - | - | - | 1 | 3 | - | - | - |
| Kansas* | 3 | - | 62 | - | - | - | - | - | 5 | 9 | 1 | 1 | 3 |
| SOUTH ATLANTIC | 24 | 5 | 147 | - | - | 4 | 4 | 3 | 29 | 77 | 18 | 1 | 29 |
| Delaware* | - | - | 3 | - | - | - | - | - | - | 1 | - | - | - |
| Maryland | - | - | 5 | - | - | - | 1 | - | 4 | 8 | 2 | - | 7 |
| District of Columbia | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| Virginia | 5 | 4 | 22 | - | - | 2 | 1 | - | 4 | 3 | 3 | - | 4 |
| West Virginia* | - | - | 42 | - | - | - | - | - | 1 | 6 | - | - | 1 |
| North Carolina | 5 | - | NN | - | - | 1 | 1 | 1 | 5 | 6 | 1 | - | 4 |
| South Carolina | 6 | - | 15 | - | - | 1 | - | - | - | 1 | 4 | - | - |
| Georgia | - | - | - | - | - | - | - | - | 2 | 21 | - | - | 6 |
| Florida* | 8 | 1 | 60 | - | - | - | 1 | 2 | 13 | 31 | 8 | 1 | 6 |
| EAST SOUTH CENTRAL | 13 | - | 72 | - | - | 2 | 14 | - | 28 | 31 | 2 | - | 3 |
| Kentucky | - | - | 54 | - | - | - | 1 | - | - | - | - | - | 3 |
| Tennessee | 2 | - | NN | - | - | - | - | - | 12 | 10 | 1 | - | - |
| Alabama | 11 | - | 11 | - | - | 2 | 1 | - | 13 | 11 | 1 | - | - |
| Mississippi | - | - | 7 | - | - | - | 12 | - | 3 | 10 | - | - | - |
| WEST SOUTH CENTRAL | 12 | 1 | 87 | - | 1 | 2 | 3 | - | 19 | 50 | 12 | 1 | 10 |
| Arkansas* | 1 | - | - | - | - | - | - | - | 3 | 8 | - | - | - |
| Louisiana | - | - | NN | - | - | - | 1 | - | 1 | 4 | 1 | 1 | 1 |
| Oklahoma | 6 | - | 7 | - | - | 1 | - | - | 9 | 8 | 3 | - | - |
| Texas* | 5 | 1 | 80 | - | 1 | 1 | 2 | - | 6 | 30 | 8 | - | 9 |
| MOUNTAIN | 1 | - | 155 | - | 2 | - | - | - | 10 | 34 | 25 | - | 6 |
| Montana | - | - | 30 | - | - | - | - | - | - | 2 | 3 | - | - |
| Idaho | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| Wyoming | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| Colorado | - | - | 116 | - | - | - | - | - | 6 | 11 | 7 | - | 4 |
| New Mexico* | - | - | 1 | - | 1 | - | - | - | 1 | 8 | 5 | - | - |
| Arizona | - | - | NN | - | 1 | - | - | - | 1 | 9 | 1 | - | 1 |
| Utah | 1 | - | 4 | - | - | - | - | - | 2 | 3 | 9 | - | - |
| Nevada* | - | - | 2 | - | - | - | - | - | - | 1 | - | - | - |
| PACIFIC | 17 | - | 280 | 3 | 40 | 2 | 7 | 2 | 85 | 121 | 55 | 7 | 64 |
| Washington | - | - | 260 | 3 | 37 | - | 2 | - | 10 | 22 | 7 | - | 4 |
| Oregon | 2 | - | - | - | - | - | - | - | 7 | 7 | 3 | - | 1 |
| California* | 12 | - | - | - | 1 | 1 | 4 | 2 | 68 | 90 | 44 | 6 | 53 |
| Alaska | - | - | 1 | - | 2 | 1 | 1 | - | - | 2 | 1 | 1 | 2 |
| Hawaii | 3 | - | 19 | - | - | - | - | - | - | - | - | - | 4 |
| Guam* | NA | NA | NA | NA | - | NA | - | - | NA | NA | NA | NA | - |
| Puerto Rico | - | - | 14 | - | - | - | - | - | 3 | 2 | 3 | - | 1 |
| Virgin Islands | - | - | - | - | - | - | - | - | - | - | - | - | - |

NA: Not notifiable

NA: Not Available

*Delayed reports: Asep. Men.: Ohio add 1; Bruc.: Ark. add 1; Chickenpox: Calif. add 20, Guam add 1; Diph.: N. Mex. add 1; Enceph., psot: Fla. delete 1; Hep. B: W. Va. add 1, Fla. delete 2, Nev. add 7; Hep. A: Kans. delete 2, Del. add 2, W. Va. delete 1, Fla. delete 8, Nev. add 6; Hep. unsp.: Del. delete 2, Fla. delete 4, Tex. delete 4, Nev. add 3; Malaria: Wisc. add 1

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending June 25, 1977 and June 26, 1976 - 25th Week

| REPORTING AREA | MEASLES (Rubeola) | | | MENINGOCOCCAL INFECTIONS TOTAL | | | MUMPS | | PERTUSSIS | RUBELLA | | TETANUS |
|----------------------------|-------------------|------------|--------|-----------------------------------|------------|------|-------|--------------|-----------|---------|--------------|--------------|
| | 1977 | CUMULATIVE | | 1977 | CUMULATIVE | | 1977 | CUM. 1977 | 1977 | 1977 | CUM. 1977 | CUM. 1977 |
| | | 1977 | 1976 | | 1977 | 1976 | | | | | | |
| UNITED STATES | 1,294 | 47,996 | 31,110 | 14 | 1,026 | 888 | 477 | 13,911 | 13 | 472 | 16,698 | 24 |
| NEW ENGLAND | 94 | 2,368 | 312 | - | 41 | 39 | 21 | 595 | - | 22 | 1,125 | - |
| Maine | 3 | 160 | 3 | - | 3 | - | - | 42 | - | - | 68 | - |
| New Hampshire | 14 | 505 | 7 | - | 3 | 3 | 1 | 89 | - | 1 | 235 | - |
| Vermont | 2 | 291 | 3 | - | 4 | 3 | - | 5 | - | - | 63 | - |
| Massachusetts* | 34 | 634 | 24 | - | 12 | 11 | 5 | 107 | - | 12 | 348 | - |
| Rhode Island | 3 | 58 | 14 | - | - | 4 | 2 | 49 | - | 1 | 130 | - |
| Connecticut | 38 | 720 | 261 | - | 19 | 18 | 13 | 303 | - | 8 | 281 | - |
| MIDDLE ATLANTIC | 379 | 7,100 | 6,395 | 2 | 146 | 120 | 63 | 1,059 | 1 | 294 | 5,376 | 1 |
| Upstate New York | 213 | 2,906 | 2,620 | 1 | 36 | 46 | 16 | 212 | 1 | 119 | 2,827 | - |
| New York City | 48 | 489 | 381 | - | 31 | 33 | 17 | 394 | - | 2 | 271 | - |
| New Jersey | 39 | 180 | 570 | 1 | 25 | 17 | 23 | 311 | - | 89 | 1,742 | 1 |
| Pennsylvania | 79 | 3,525 | 2,824 | - | 50 | 24 | 7 | 142 | - | 84 | 536 | - |
| EAST NORTH CENTRAL | 191 | 9,556 | 13,195 | 2 | 101 | 112 | 156 | 4,812 | 2 | 43 | 3,403 | 1 |
| Ohio | - | 941 | 489 | - | 35 | 46 | 7 | 620 | - | 7 | 1,071 | - |
| Indiana | 38 | 4,185 | 2,786 | - | 7 | 5 | 4 | 255 | - | 4 | 876 | - |
| Illinois | 84 | 1,324 | 1,395 | - | 19 | 12 | 44 | 797 | - | 16 | 278 | - |
| Michigan | 34 | 846 | 5,364 | 1 | 27 | 41 | 73 | 1,671 | - | 11 | 826 | 1 |
| Wisconsin* | 35 | 2,260 | 3,161 | 1 | 13 | 8 | 28 | 1,469 | 2 | 5 | 352 | - |
| WEST NORTH CENTRAL | 98 | 9,317 | 1,149 | 1 | 64 | 64 | 154 | 3,308 | 1 | 12 | 483 | 3 |
| Minnesota | 45 | 2,584 | 386 | - | 21 | 14 | - | 5 | - | - | 16 | 1 |
| Iowa | 31 | 4,236 | 36 | - | 5 | 8 | - | 1,241 | - | 7 | 156 | - |
| Missouri | 22 | 911 | 14 | - | 26 | 20 | 144 | 1,026 | - | 1 | 33 | 1 |
| North Dakota | - | 20 | 3 | - | 1 | 3 | - | 13 | - | - | 10 | - |
| South Dakota | - | 51 | 2 | - | 4 | 2 | - | 55 | 1 | - | 17 | - |
| Nebraska | - | 192 | 54 | - | 1 | 4 | - | 55 | - | - | 2 | - |
| Kansas* | - | 1,323 | 654 | 1 | 6 | 13 | 10 | 909 | - | 4 | 249 | 1 |
| SOUTH ATLANTIC | 68 | 4,006 | 1,774 | 2 | 219 | 177 | 14 | 595 | 3 | 18 | 1,509 | 8 |
| Delaware | - | 22 | 124 | - | 3 | 2 | - | 95 | - | - | 23 | - |
| Maryland | - | 343 | 671 | - | 15 | 16 | 1 | 44 | - | - | 5 | - |
| District of Columbia | - | 1 | 7 | - | - | 2 | - | 5 | - | - | - | - |
| Virginia | 40 | 2,344 | 473 | 1 | 13 | 29 | - | 80 | 2 | 3 | 556 | 1 |
| West Virginia* | 6 | 199 | 171 | - | 8 | 4 | 3 | 136 | - | 4 | 87 | - |
| North Carolina | - | 50 | - | 1 | 54 | 33 | 1 | 32 | - | 3 | 414 | - |
| South Carolina | 2 | 145 | 4 | - | 22 | 31 | - | 10 | - | - | 206 | - |
| Georgia | 9 | 718 | - | - | 37 | 16 | - | 13 | - | - | 47 | 1 |
| Florida* | 11 | 184 | 324 | - | 67 | 44 | 9 | 180 | 1 | 8 | 171 | 6 |
| EAST SOUTH CENTRAL | 53 | 1,790 | 741 | 1 | 116 | 77 | 14 | 718 | 1 | 11 | 1,869 | 2 |
| Kentucky | 44 | 1,065 | 703 | - | 19 | 14 | - | 79 | - | 1 | 73 | 1 |
| Tennessee | 8 | 621 | 23 | - | 31 | 34 | 11 | 421 | 1 | 10 | 1,681 | 1 |
| Alabama | - | 76 | - | 1 | 45 | 21 | 1 | 191 | - | - | 108 | - |
| Mississippi | 1 | 28 | 15 | - | 21 | 8 | 2 | 27 | - | - | 7 | - |
| WEST SOUTH CENTRAL | 14 | 1,955 | 621 | 5 | 184 | 141 | 24 | 1,200 | - | 7 | 726 | 4 |
| Arkansas* | - | 26 | - | - | 9 | 7 | - | 30 | - | - | 1 | 1 |
| Louisiana | - | 74 | 179 | 1 | 68 | 26 | - | 30 | - | - | 26 | 1 |
| Oklahoma | - | 52 | 281 | - | 11 | 18 | 1 | 445 | - | 1 | 27 | - |
| Texas* | 14 | 1,803 | 161 | 4 | 96 | 90 | 23 | 695 | - | 6 | 672 | 2 |
| MOUNTAIN | 57 | 2,361 | 4,901 | - | 37 | 27 | 5 | 546 | 2 | 4 | 323 | 1 |
| Montana | 48 | 1,127 | 199 | - | 2 | 3 | 2 | 7 | - | 1 | 12 | - |
| Idaho | - | 125 | 2,019 | - | 4 | 3 | - | 117 | - | 2 | 10 | - |
| Wyoming | - | 13 | 3 | - | 1 | - | - | - | - | - | 2 | 1 |
| Colorado | - | 476 | 225 | - | 1 | 5 | - | 246 | - | - | 226 | - |
| New Mexico | 2 | 265 | 14 | - | 17 | 3 | 3 | 102 | 2 | 1 | 9 | - |
| Arizona | 6 | 262 | 224 | - | 10 | 7 | - | - | - | - | 10 | - |
| Utah | 1 | 6 | 2,154 | - | 1 | 4 | - | 67 | - | - | 47 | - |
| Nevada | - | 87 | 63 | - | 1 | 2 | - | 7 | - | - | 7 | - |
| PACIFIC | 340 | 9,543 | 2,022 | 1 | 118 | 131 | 26 | 1,078 | 3 | 61 | 1,884 | 4 |
| Washington | 22 | 502 | 306 | - | 15 | 20 | - | 254 | - | 6 | 429 | - |
| Oregon | 6 | 315 | 132 | - | 11 | 13 | 4 | 192 | 1 | 2 | 98 | - |
| California | 312 | 8,637 | 1,582 | 1 | 72 | 87 | 21 | 590 | 2 | 45 | 1,337 | 4 |
| Alaska* | - | 55 | - | - | 18 | 9 | - | 25 | - | - | 1 | - |
| Hawaii | - | 34 | 2 | - | 2 | 2 | 1 | 17 | - | 8 | 19 | - |
| Guam* | NA | 4 | 9 | - | - | - | NA | 1 | NA | NA | 6 | - |
| Puerto Rico | 24 | 741 | 224 | - | - | 3 | 36 | 504 | 1 | 6 | 29 | 7 |
| Virgin Islands | - | 10 | 7 | - | - | - | 1 | 176 | - | - | - | - |

NA: Not available

*Delayed reports: Measles: Mass. delete 3, Kans. delete 9, Ark. add 2, Tex. delete 2; Men. Inf.: Fla. delete 2, Alaska add 4; Mumps: Guam add 1; Rubella: Wisc. add 6, W. Va. add 3, Fla. delete 1, Ark. add 2

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending June 25, 1977 and June 26, 1976 - 25th Week

| REPORTING AREA | TUBERCULOSIS | | TULA-REMI | TYPHOID FEVER | | TYPHUS-FEVER TICK-BORNE (RMSF) | | VENEREAL DISEASES (Civilian Cases Only) | | | | | RABIES IN ANIMALS | |
|----------------------------|--------------|-----------|-----------|---------------|-----------|--------------------------------|-----------|---|------------|------------------------|------|------------|-------------------|-------|
| | 1977 | CUM. 1977 | CUM. 1977 | 1977 | CUM. 1977 | 1977 | CUM. 1977 | GONORRHEA | | SYPHILIS (Pri. & Sec.) | | | CUM. 1977 | |
| | | | | | | | | 1977 | CUMULATIVE | | 1977 | CUMULATIVE | | |
| | | | | | | | | | 1977 | 1976 | | 1977 | | 1976 |
| UNITED STATES | 700 | 14,671 | 50 | 5 | 171 | 48 | 376 | 20,219 | 450,460 | 463,329 | 391 | 9,961 | 11,949 | 1,352 |
| NEW ENGLAND | 37 | 550 | 1 | 1 | 11 | - | 5 | 540 | 11,543 | 12,372 | 22 | 411 | 348 | 20 |
| Maine | 2 | 41 | - | - | - | - | - | NA | 819 | 1,077 | NA | 10 | 8 | 18 |
| New Hampshire | 2 | 17 | - | - | - | - | - | 23 | 465 | 336 | - | 3 | 5 | 1 |
| Vermont | - | 21 | - | - | - | - | - | 12 | 299 | 306 | 1 | 5 | 2 | - |
| Massachusetts | 23 | 302 | 1 | 1 | 8 | - | 255 | 5,038 | 5,852 | 15 | 296 | 244 | - | - |
| Rhode Island | 2 | 41 | - | - | 2 | - | 3 | 45 | 966 | 847 | 1 | 6 | 12 | - |
| Connecticut | 8 | 128 | - | - | 1 | - | 2 | 205 | 3,956 | 3,954 | 5 | 91 | 77 | 1 |
| MIDDLE ATLANTIC | 111 | 2,334 | - | 1 | 33 | 8 | 24 | 1,471 | 46,058 | 51,393 | 56 | 1,396 | 2,009 | 27 |
| Upstate New York | 21 | 370 | - | 1 | 5 | 8 | 12 | 217 | 7,471 | 8,247 | 7 | 126 | 130 | 16 |
| New York City | 27 | 771 | - | - | 13 | - | - | 424 | 18,776 | 22,833 | 33 | 881 | 1,269 | - |
| New Jersey | 31 | 591 | - | - | 13 | - | 4 | 344 | 7,691 | 7,794 | 7 | 180 | 271 | 10 |
| Pennsylvania | 32 | 602 | - | - | 2 | - | 8 | 486 | 12,120 | 12,519 | 9 | 209 | 339 | 1 |
| EAST NORTH CENTRAL | 81 | 2,295 | 3 | - | 16 | - | 1 | 4,197 | 69,668 | 72,863 | 58 | 1,053 | 1,059 | 52 |
| Ohio | 18 | 358 | 1 | - | 5 | - | - | 1,153 | 18,147 | 17,965 | 8 | 263 | 253 | - |
| Indiana | 10 | 263 | - | - | 1 | - | - | 160 | 6,121 | 6,770 | 4 | 75 | 53 | 2 |
| Illinois* | 29 | 908 | - | - | 1 | - | - | 1,631 | 23,126 | 26,299 | 40 | 554 | 565 | 14 |
| Michigan* | 19 | 659 | - | - | 9 | - | 1 | 985 | 15,837 | 15,463 | 4 | 112 | 135 | 3 |
| Wisconsin* | 5 | 111 | 2 | - | - | - | - | 268 | 6,437 | 6,366 | 2 | 49 | 53 | 33 |
| WEST NORTH CENTRAL | 25 | 507 | 5 | 1 | 12 | - | 10 | 1,054 | 23,507 | 23,899 | 7 | 237 | 211 | 326 |
| Minnesota | 12 | 109 | - | 1 | 4 | - | - | 161 | 4,120 | 4,341 | 1 | 71 | 44 | 117 |
| Iowa | 2 | 54 | - | - | - | - | - | 162 | 2,844 | 3,050 | 1 | 27 | 21 | 56 |
| Missouri | 7 | 208 | 4 | - | 4 | - | 7 | 371 | 9,960 | 9,404 | 3 | 81 | 89 | 27 |
| North Dakota | - | 13 | - | - | - | - | - | 22 | 431 | 355 | - | - | - | 44 |
| South Dakota | - | 25 | 1 | - | - | - | - | 27 | 632 | 661 | 1 | 2 | 2 | 59 |
| Nebraska* | - | 18 | - | - | 1 | - | - | 151 | 2,072 | 2,052 | - | 22 | 14 | - |
| Kansas* | 4 | 80 | - | - | 3 | - | 3 | 160 | 3,448 | 4,036 | 1 | 34 | 41 | 23 |
| SOUTH ATLANTIC | 149 | 3,315 | 8 | 2 | 30 | 23 | 208 | 5,192 | 110,665 | 113,120 | 99 | 2,859 | 3,590 | 140 |
| Delaware | 1 | 26 | - | - | - | - | 1 | 82 | 1,501 | 1,421 | - | 16 | 38 | 1 |
| Maryland | 19 | 469 | 1 | - | - | 5 | 22 | 674 | 14,103 | 15,298 | 8 | 195 | 302 | - |
| District of Columbia | 12 | 164 | - | 1 | 1 | - | - | 424 | 7,334 | 7,854 | 13 | 299 | 284 | - |
| Virginia* | 11 | 369 | - | - | 7 | 9 | 67 | 518 | 11,494 | 12,032 | 11 | 280 | 303 | 2 |
| West Virginia | 6 | 122 | - | - | 3 | - | 1 | 48 | 1,612 | 1,485 | - | 1 | 17 | 2 |
| North Carolina* | 27 | 570 | 2 | 1 | 2 | 9 | 79 | 751 | 16,362 | 16,302 | 17 | 416 | 674 | 4 |
| South Carolina* | 5 | 309 | 2 | - | - | - | 17 | 560 | 10,326 | 11,196 | 2 | 122 | 194 | 3 |
| Georgia | 26 | 372 | 3 | - | 9 | - | 21 | 1,023 | 21,500 | 20,730 | 18 | 543 | 504 | 92 |
| Florida | 42 | 914 | - | - | 8 | - | - | 1,112 | 26,433 | 26,802 | 30 | 987 | 1,274 | 36 |
| EAST SOUTH CENTRAL | 67 | 1,295 | 3 | - | 3 | 6 | 55 | 1,980 | 40,011 | 41,613 | 20 | 352 | 482 | 42 |
| Kentucky | 15 | 305 | 1 | - | - | - | 10 | 195 | 5,432 | 5,258 | 4 | 39 | 70 | 12 |
| Tennessee | 18 | 423 | 2 | - | 1 | 5 | 41 | 708 | 15,914 | 16,357 | 8 | 112 | 187 | 23 |
| Alabama | 22 | 356 | - | - | 1 | 1 | 4 | 667 | 11,229 | 11,892 | 2 | 60 | 95 | 7 |
| Mississippi* | 12 | 211 | - | - | 1 | - | - | 410 | 7,436 | 8,106 | 6 | 141 | 130 | - |
| WEST SOUTH CENTRAL | 101 | 1,731 | 25 | - | 7 | 10 | 71 | 2,224 | 57,771 | 61,831 | 43 | 1,379 | 1,370 | 461 |
| Arkansas* | 14 | 196 | 15 | - | - | - | 9 | 144 | 4,531 | 5,952 | - | 30 | 44 | 66 |
| Louisiana | 12 | 336 | 1 | - | - | - | - | 288 | 8,514 | 9,081 | 5 | 292 | 288 | 4 |
| Oklahoma | 7 | 169 | 4 | - | 1 | 8 | 48 | 246 | 5,351 | 5,618 | - | 37 | 52 | 154 |
| Texas | 68 | 1,030 | 5 | - | 6 | 2 | 14 | 1,546 | 39,375 | 41,180 | 38 | 1,020 | 986 | 237 |
| MOUNTAIN | 20 | 389 | 4 | - | 14 | 1 | 2 | 771 | 18,021 | 18,483 | 19 | 214 | 360 | 58 |
| Montana* | 2 | 22 | 1 | - | - | 1 | 2 | 33 | 870 | 922 | 1 | 1 | 4 | 28 |
| Idaho | - | 19 | - | - | - | - | - | 32 | 855 | 967 | - | 4 | 13 | - |
| Wyoming | - | 7 | 1 | - | - | - | - | 11 | 443 | 373 | 1 | 14 | 7 | - |
| Colorado | 5 | 64 | 2 | - | 7 | - | - | 194 | 4,700 | 4,546 | 5 | 62 | 89 | 4 |
| New Mexico | 4 | 56 | - | - | - | - | - | 138 | 2,668 | 3,530 | 6 | 40 | 92 | - |
| Arizona* | 6 | 184 | - | - | 3 | - | - | 201 | 5,318 | 5,581 | 6 | 83 | 116 | 25 |
| Utah | - | 15 | - | - | 4 | - | - | 65 | 1,013 | 904 | - | 4 | 16 | 1 |
| Nevada* | 3 | 22 | - | - | - | - | - | 97 | 2,154 | 1,660 | - | 6 | 23 | - |
| PACIFIC | 109 | 2,251 | 1 | - | 45 | - | - | 2,790 | 73,216 | 67,755 | 67 | 2,060 | 2,520 | 226 |
| Washington | NA | 132 | - | - | 1 | - | - | 229 | 5,514 | 5,761 | NA | 76 | 71 | - |
| Oregon | 2 | 102 | - | - | 3 | - | - | 230 | 5,077 | 5,154 | 3 | 64 | 59 | 1 |
| California | 94 | 1,679 | 1 | - | 40 | - | - | 2,138 | 58,656 | 53,669 | 64 | 1,887 | 2,332 | 213 |
| Alaska | - | 31 | - | - | - | - | - | 122 | 2,381 | 1,874 | - | 13 | 10 | 12 |
| Hawaii | 13 | 307 | - | - | 1 | - | - | 71 | 1,588 | 1,297 | - | 20 | 48 | - |
| Guam* | NA | 33 | - | NA | 1 | NA | - | NA | 102 | 172 | NA | 1 | 1 | - |
| Puerto Rico | 4 | 166 | - | 1 | 4 | - | - | 53 | 1,532 | 1,281 | 7 | 275 | 279 | 31 |
| Virgin Islands* | - | 1 | - | - | - | - | - | 4 | 93 | 130 | - | 3 | 35 | - |

NA: Not available

*Delayed reports: TB: Mich. delete 1, Wisc. delete 6, Kansas delete 1, N. Car. delete 6, S. Car. delete 2; Tularemia: Ariz. add 1; Typhoid fever: Ark. add 1; RMSF: Va. delete 1; GC: Ill. add 17 (1976) Nebr. delete 1, Nev. add 170 civ., add 5 mil, Guam add 2, V.I. add 3 (1977); Syphilis: Ill. delete 82 (1976), Miss. delete 1, Mont. add 1 (1977)

Table IV
Deaths in 121 United States Cities*
Week Ending June 25, 1977 - 25th Week

| REPORTING AREA | ALL CAUSES | | | | | | Pneu- monia and Influenza ALL AGES | REPORTING AREA | ALL CAUSES | | | | | | Pneu- monia 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 | | |
| NEW ENGLAND | 674 | 405 | 200 | 33 | 22 | 32 | | SOUTH ATLANTIC | 1,062 | 604 | 301 | 75 | 48 | 44 | |
| Boston, Mass. | 198 | 105 | 70 | 12 | 5 | 15 | | Atlanta, Ga. | 169 | 90 | 46 | 16 | 13 | 3 | |
| Bridgeport, Conn. | 30 | 21 | 5 | 1 | 1 | 3 | | Baltimore, Md. | 136 | 68 | 46 | 13 | 7 | 4 | |
| Cambridge, Mass. | 27 | 20 | 6 | 1 | - | 1 | | Charlotte, N. C. | 52 | 30 | 15 | 4 | 1 | 5 | |
| Fall River, Mass. | 32 | 28 | 3 | - | - | - | | Jacksonville, Fla. | 95 | 50 | 23 | 10 | 5 | 7 | |
| Hartford, Conn. | 67 | 35 | 22 | 4 | 5 | 2 | | Miami, Fla. | 128 | 74 | 35 | 9 | 4 | 4 | |
| Lowell, Mass. | 23 | 16 | 7 | - | - | 1 | | Norfolk, Va. | 54 | 25 | 21 | 5 | 1 | 3 | |
| Lynn, Mass. | 25 | 17 | 6 | 1 | 1 | 1 | | Richmond, Va. | 97 | 44 | 35 | 3 | 2 | 3 | |
| New Bedford, Mass. | 20 | 14 | 5 | 1 | - | - | | Savannah, Ga. | 31 | 21 | 5 | 4 | 1 | 2 | |
| New Haven, Conn. | 44 | 23 | 15 | 3 | 3 | - | | St. Petersburg, Fla. | 56 | 46 | 9 | - | - | 2 | |
| Providence, R.I. | 66 | 31 | 24 | 2 | 5 | 5 | | Tampa, Fla. | 83 | 52 | 18 | 5 | 6 | 8 | |
| Somerville, Mass. | 13 | 9 | 3 | 1 | - | 1 | | Washington, D. C. | 117 | 74 | 33 | 5 | 3 | 2 | |
| Springfield, Mass. | 37 | 21 | 11 | 5 | - | 1 | | Wilmington, Del. | 54 | 30 | 15 | 1 | 5 | 1 | |
| Waterbury, Conn. | 39 | 27 | 11 | - | - | 2 | | | | | | | | | |
| Worcester, Mass. | 53 | 38 | 12 | 2 | 1 | - | | EAST SOUTH CENTRAL | 661 | 374 | 188 | 41 | 24 | 25 | |
| MIDDLE ATLANTIC | 2,836 | 1,736 | 737 | 190 | 99 | 125 | | Birmingham, Ala. | 107 | 58 | 33 | 8 | 6 | 1 | |
| Albany, N. Y. | 49 | 30 | 9 | 5 | 4 | - | | Chattanooga, Tenn. | 40 | 25 | 8 | 4 | 1 | 2 | |
| Allentown, Pa. | 19 | 14 | 5 | - | - | - | | Knoxville, Tenn. | 39 | 26 | 6 | 5 | - | 1 | |
| Buffalo, N. Y. | 91 | 61 | 17 | 8 | 3 | 12 | | Louisville, Ky. | 133 | 67 | 43 | 10 | 6 | 9 | |
| Camden, N. J. | 31 | 17 | 12 | 1 | 1 | 2 | | Memphis, Tenn. | 155 | 98 | 38 | 9 | 4 | - | |
| Elizabeth, N. J. | 26 | 17 | 7 | 2 | - | - | | Mobile, Ala. | 59 | 32 | 16 | 4 | 2 | 3 | |
| Erie, Pa. | 26 | 17 | 7 | 1 | 1 | 3 | | Montgomery, Ala. | 35 | 21 | 8 | - | 3 | 2 | |
| Jersey City, N. J. | 46 | 31 | 12 | 1 | - | - | | Nashville, Tenn. | 93 | 47 | 36 | 1 | 2 | 7 | |
| Newark, N. J. | 62 | 23 | 21 | 12 | 1 | 2 | | WEST SOUTH CENTRAL | 1,164 | 649 | 301 | 92 | 56 | 23 | |
| New York City, N. Y. | 1,300 | 807 | 327 | 93 | 39 | 47 | | Austin, Tex. | 52 | 38 | 6 | 4 | 2 | 2 | |
| Paterson, N. J. | 44 | 26 | 11 | 1 | 6 | 4 | | Baton Rouge, La. | 69 | 36 | 19 | 10 | 3 | - | |
| Philadelphia, Pa. | 514 | 297 | 140 | 33 | 26 | 25 | | Corpus Christi, Tex. | 28 | 15 | 5 | 1 | 7 | 1 | |
| Pittsburgh, Pa. | 198 | 112 | 62 | 14 | 5 | 9 | | Dallas, Tex. | 186 | 100 | 46 | 15 | 12 | 3 | |
| Reading, Pa. | 32 | 22 | 7 | 2 | - | 2 | | El Paso, Tex. | 55 | 25 | 14 | 6 | 2 | 2 | |
| Rochester, N. Y. | 134 | 86 | 35 | 9 | 2 | 9 | | Fort Worth, Tex. | 74 | 42 | 20 | 6 | 2 | 1 | |
| Schenectady, N. Y. | 20 | 14 | 5 | - | 1 | 1 | | Houston, Tex. | 265 | 139 | 71 | 26 | 13 | 3 | |
| Scranton, Pa. | 44 | 30 | 10 | 2 | - | 1 | | Little Rock, Ark. | 54 | 31 | 13 | 2 | 4 | 2 | |
| Syracuse, N. Y. | 86 | 48 | 27 | 3 | 7 | - | | New Orleans, La. | 94 | 56 | 28 | 4 | 2 | - | |
| Trenton, N. J. | 39 | 28 | 7 | 2 | 2 | 5 | | San Antonio, Tex. | 134 | 73 | 39 | 10 | 4 | 1 | |
| Utica, N. Y. | 39 | 29 | 9 | - | - | 1 | | Shreveport, La. | 61 | 39 | 16 | 4 | 2 | 3 | |
| Yonkers, N. Y. | 36 | 27 | 7 | 1 | - | 2 | | Tulsa, Okla. | 92 | 55 | 24 | 4 | 3 | 5 | |
| EAST NORTH CENTRAL | 2,235 | 1,304 | 585 | 162 | 92 | 40 | | MOUNTAIN | 449 | 265 | 98 | 38 | 18 | 10 | |
| Akron, Ohio | 91 | 63 | 15 | 5 | 4 | - | | Albuquerque, N. Mex. | 44 | 27 | 7 | 6 | 2 | 1 | |
| Canton, Ohio | 42 | 29 | 10 | - | 2 | 1 | | Colorado Springs, Colo. | 20 | 13 | 6 | 1 | - | - | |
| Chicago, Ill. | 543 | 286 | 152 | 51 | 32 | 9 | | Denver, Colo. | 107 | 63 | 20 | 6 | 7 | 2 | |
| Cincinnati, Ohio | 155 | 87 | 44 | 10 | 8 | 4 | | Las Vegas, Nev. | 26 | 14 | 8 | 3 | - | 1 | |
| Cleveland, Ohio | 187 | 103 | 59 | 17 | 2 | 1 | | Ogden, Utah | 19 | 16 | 2 | - | - | 2 | |
| Columbus, Ohio | 89 | 53 | 20 | 6 | 6 | 1 | | Phoenix, Ariz. | 112 | 58 | 33 | 8 | 1 | 1 | |
| Dayton, Ohio | 104 | 69 | 23 | 8 | 2 | 2 | | Pueblo, Colo. | 18 | 10 | 4 | 3 | - | 1 | |
| Detroit, Mich. | 282 | 147 | 95 | 23 | 9 | 3 | | Salt Lake City, Utah | 33 | 23 | 3 | 4 | 3 | 1 | |
| Evansville, Ind. | 33 | 18 | 9 | 3 | - | 1 | | Tucson, Ariz. | 70 | 41 | 15 | 7 | 5 | 1 | |
| Fort Wayne, Ind. | 42 | 26 | 12 | - | 2 | 3 | | PACIFIC | 1,671 | 1,052 | 383 | 107 | 60 | 35 | |
| Gary, Ind. | 25 | 14 | 6 | 3 | 1 | - | | Berkeley, Calif. | 22 | 15 | 6 | 1 | - | 2 | |
| Grand Rapids, Mich. | 47 | 37 | 5 | 3 | 1 | - | | Fresno, Calif. | 69 | 31 | 19 | 10 | 8 | 1 | |
| Indianapolis, Ind. | 156 | 94 | 34 | 9 | 10 | 3 | | Glendale, Calif. | 32 | 25 | 6 | - | - | - | |
| Madison, Wis. | 42 | 22 | 13 | 2 | 2 | 4 | | Honolulu, Hawaii | 56 | 29 | 18 | 3 | 4 | 1 | |
| Milwaukee, Wis. | 109 | 72 | 30 | 2 | 3 | 3 | | Long Beach, Calif. | 90 | 56 | 27 | 3 | 3 | 2 | |
| Peoria, Ill. | 31 | 18 | 8 | 3 | - | 3 | | Los Angeles, Calif. | 530 | 321 | 119 | 41 | 20 | 6 | |
| Rockford, Ill. | 37 | 25 | 6 | 3 | 1 | 4 | | Oakland, Calif. | 88 | 51 | 22 | 8 | 3 | 4 | |
| South Bend, Ind. | 36 | 24 | 7 | 3 | - | 1 | | Pasadena, Calif. | 41 | 29 | 8 | - | 2 | - | |
| Toledo, Ohio | 122 | 75 | 24 | 6 | 7 | - | | Portland, Oreg. | 126 | 80 | 32 | 6 | 3 | - | |
| Youngstown, Ohio | 62 | 42 | 13 | 5 | - | - | | Sacramento, Calif. | 52 | 34 | 14 | 1 | 2 | 1 | |
| WEST NORTH CENTRAL | 699 | 417 | 178 | 38 | 33 | 15 | | San Diego, Calif. | 105 | 70 | 20 | 7 | 2 | 2 | |
| Des Moines, Iowa | 72 | 39 | 15 | 7 | 5 | 3 | | San Francisco, Calif. | 163 | 109 | 31 | 11 | 7 | 1 | |
| Duluth, Minn. | 12 | 8 | 2 | - | - | - | | San Jose, Calif. | 56 | 39 | 7 | 8 | - | 4 | |
| Kansas City, Kans. | 25 | 15 | 7 | 2 | - | 1 | | Seattle, Wash. | 137 | 98 | 24 | 6 | 5 | 4 | |
| Kansas City, Mo. | 129 | 80 | 35 | 2 | 9 | 2 | | Spokane, Wash. | 58 | 34 | 15 | 2 | 1 | 5 | |
| Lincoln, Nebr. | 28 | 10 | 11 | 4 | 1 | 1 | | Tacoma, Wash. | 46 | 31 | 15 | - | - | 2 | |
| Minneapolis, Minn. | 82 | 51 | 18 | 4 | 6 | 2 | | | | | | | | | |
| Omaha, Nebr. | 88 | 49 | 19 | 8 | 2 | - | | TOTAL | 11,451 | 6,806 | 2,971 | 776 | 452 | 349 | |
| St. Louis, Mo. | 154 | 95 | 46 | 7 | 3 | 3 | | Expected Number | 11,212 | 6,735 | 2,909 | 740 | 377 | 348 | |
| St. Paul, Minn. | 63 | 43 | 12 | 4 | 3 | 1 | | | | | | | | | |
| Wichita, Kans. | 46 | 27 | 13 | - | 4 | 2 | | | | | | | | | |

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

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St. Louis Encephalitis — Texas, Mississippi

The first documented case of human infection with St. Louis encephalitis (SLE) virus for 1977 has been reported from Dallas, Texas. The patient, an 89-year-old man living in the city, had onset of illness on June 10, becoming disoriented, febrile, and tremulous. Pleocytosis was shown in cerebrospinal fluid obtained from lumbar punctures on 2 occasions, and he had a hemagglutination-inhibition antibody titer of 1:640 in serum drawn on June 15. His condition has improved, and he was scheduled for release on June 28.

In May, 2 of the 10 sentinel chicken flocks maintained for SLE surveillance in Dallas showed evidence of infection with SLE virus. The flocks were at separate locations in the city, but neither was near the patient's home. The regular mosquito larviciding program in Dallas has been supplemented by increased ultra-low-volume adulticiding, and efforts to eliminate breeding containers around homes have

been intensified. Studies to isolate SLE virus from mosquitoes and studies to demonstrate antibodies in wild birds are in progress.

The Mississippi State Board of Health has also reported evidence of low, but widespread, levels of SLE activity. In June, juvenile sparrows bled near Clarksdale, Greenwood, Hattiesburg, and Jackson were found to have antibodies to the virus.

Reported by JP Luby, MD, University of Texas; EL Berry, MD, L Freeman, JT Gentry, and JR Williams, MD, Dallas Environmental and Health Depts; Linda Chandler, RN, and CR Webb, Jr, MD, State Epidemiologist, Texas State Dept of Health Resources; DL Blakey, MD, State Epidemiologist, and J McMillan, Mississippi State Board of Health.

Editorial Note: This is the earliest laboratory-documented case of human infection with SLE virus ever reported in Dallas and may be the earliest reported in the United States.

Plague — Arizona, Colorado, New Mexico

Four cases of human bubonic plague have thus far been reported to CDC for 1977. Two cases were acquired in New Mexico, 1 in Colorado, and 1 in Arizona (Table 1). Two cases have had secondary pneumonic involvement.

TABLE 1. Reported confirmed cases of plague, United States, 1977

| Case | Age | Sex | Onset | Outcome | County | State |
|------|-----|-----|-------|---------|------------|-------|
| 1 | 38 | M | Feb | R* | Moffat | CO |
| 2 | 3 | M | June | R | McKinley | NM |
| 3 | 23 | F | June | R | Coconino | AZ |
| 4 | 43 | M | June | R | Rio Arriba | NM |

*Recovered or recovering

The case history of patient 3 is of particular interest because she apparently acquired her infection from her pet cat. On June 13 the 23-year-old woman had onset of fever and malaise. On June 15 she developed a sore throat and marked right anterior cervical swelling. She was admitted to a hospital that day, where blood cultures were made and penicillin therapy was initiated.

Because of marked cervical edema and tracheal displacement, a surgical exploration to drain a suspected abscess was undertaken early on June 16. A single large necrotic lymph node was found, but no abscess was noted. A nasotracheal tube was inserted to prevent further compromise of her airway.

On June 16, she was placed on carbenicillin, but later that day blood cultures were found to contain a gram-negative coccobacillus, and she was started on amikacin therapy.

On June 17, she had X-ray evidence of bilateral pulmonary infiltrates, right pleural effusion, and dry cough. Plague was suspected, and her therapy was changed to streptomycin and tetracycline. Methylprednisolone therapy was also begun.

On June 18, the organism isolated in the initial blood cultures was presumptively identified as *Yersinia pestis* by CDC. Cultures of the cervical lymph node also yielded *Y. pestis*.

The patient's illness was further complicated by disseminated intravascular coagulation on June 19. She developed cutaneous ecchymoses at the base of her neck and right upper thorax, melena, and hematuria. Pertinent laboratory

findings included increased partial thromboplastin and prothrombin times, elevated levels of fibrin split products, a platelet count of 78,000/mm³, a hemoglobin of 8.1 gm%, and a hematocrit of 25%. She subsequently became stable and is clinically improving, with reversal of the abnormal clotting factors.

Epidemiologic investigation revealed that the patient, her husband, and 6-year-old daughter first noted illness in their pet cat on June 6. The animal was uncoordinated, drooled at the mouth, and coughed up blood. The cat was handled by all 3 family members, but only the parents held the cat by the nape of the neck and peered into its mouth. The cat was last seen by the family on June 11 or 12. It was later found dead by the father, and *Y. pestis* was isolated from its tissues. Investigations into the source of infection for the cat are continuing.

Sixty-seven potential contacts of the patient were placed on temperature surveillance and antibiotic prophylaxis. Of these, 19 were considered to be close contacts of the patient after she developed pneumonia and before she was placed in isolation; 20 others were in contact with her during her untreated pharyngeal involvement, and 28 had minimal contact. Four contacts who complained of a sore throat had throat cultures taken before antibiotics were administered; all were negative. No secondary cases were identified.

Reported by W Green, MD, G Gorman, MD, Flagstaff; JM Counts, DrPH, State Epidemiologist, F Marks, BS, Arizona State Dept of Health Services; TM Vernon, MD, State Epidemiologist, Colorado Dept of Health; JM Mann, MD, Acting State Epidemiologist, New Mexico Health and Social Services Dept; Plague Br, Vector-Borne Diseases Div, Bur of Laboratories; and Bacterial Zoonoses Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: The transmission of *Y. pestis* to humans by domestic cats is rare, with only 1 such instance reported in the literature (1). At least 1 instance of plague acquired from wild felines has also been documented in the United States (2).

In the Arizona case, it is presumed that the patient first acquired pharyngeal infection with cervical lymph node involvement as the result of droplet transmission from her pet cat. The temporal development of pneumonia indicates that this was a secondary complication.

Plague — Continued

This case report is illustrative of the delays frequently encountered in the diagnosis of plague pneumonia and the resulting potential for development of secondary primary pneumonic cases. In the period 1975 to date, 10 of 40 plague patients reported in the United States had secondary pneumonia. Only 1 was placed in isolation before pneumonia developed. About 800 contacts of plague patients with confirmed or suspected pneumonia in this time period

Fatal Malaria Associated with a Camera Safari to Kenya and Tanzania

On January 23, 1977, a 51-year-old man was admitted to a Baltimore hospital with a history of malaise, anorexia, and jaundice, and for the past 6 days recurrent chills, fever, and diaphoresis. One month before admission, he had taken part in a "camera" safari to Kenya and Tanzania. He had not taken antimalarial prophylaxis.

On admission he was alert, but jaundiced. His temperature was 99.4°F orally, his pulse was 120/minute, and his blood pressure was 100/70 mmHg. His liver was palpable, 2 cm below the right costal margin, but his spleen was not palpable. Other physical findings were within normal limits.

Laboratory data showed normal hemoglobin, hematocrit, white blood cell count, electrolyte values, chest roentgenogram, and urinalysis, but a thin blood smear revealed *Plasmodium falciparum*.

The patient was started on hydroxychloroquine and quinine orally, but on the second hospital day, his temperature rose to 105 F, and he became increasingly lethargic and hypotensive. His blood pressure stabilized after vigorous intravenous fluid therapy, but his hematocrit dropped from 40% (recorded on admission) to 26%. Fibrinogen and fibrin split products were reduced. He was given packed red blood cells and fresh frozen plasma. Over the next 2 days he became oliguric and developed generalized edema, and on the fourth hospital day, because of his increasing abdominal girth, he underwent abdominocentesis. This disclosed grossly bloody fluid with a hematocrit of 39%. The following day he developed pulmonary edema, requiring intubation and positive end-expiratory pressure ventilation. An exploratory laparotomy revealed 3 to 4 liters of grossly bloody peritoneal fluid and a ruptured spleen, which was removed. Peritoneal dialysis was started on the fifth hospital day. The patient's renal failure and pulmonary edema gradually began to resolve, but on the the afternoon of the eighth hospital day, his temperature rose to 102 F, his

were given prophylactic antimicrobial therapy; no secondary cases, however, have occurred.

References

1. Issacson M, Levy D, Te BJ, et al: Unusual cases of human plague in Southern Africa. *S Afr Med J* 4:2109-2113, 1973
2. Poland JD, Barnes AM, Herman JJ: Human bubonic plague from exposure to a naturally infected wild carnivore. *Am J Epidemiol* 97:332-337, 1973

blood pressure fell to 50/30 mmHg, and he had a cardiac arrest. Despite attempts at resuscitation, he died.

No parasites were seen in blood smears taken on the day of death, but *Pseudomonas aeruginosa* was isolated from a blood culture. Postmortem examination revealed hemorrhagic necrotizing pneumonia in both lungs, from which *P. aeruginosa* and *Staphylococcus aureus* were isolated, congestion of the sinusoids of the liver and capillaries of the spleen with parasitized erythrocytes and malaria pigment, hemoglobinuric nephrosis, and acute tubular necrosis. Reported by F Farra, MD, VR Hrehorovich, MD, B Kasimis, MD, D Sawhney, MD, South Baltimore General Hospital; KH Acree, MCDM, State Epidemiologist, Maryland Dept of Health and Mental Hygiene; and Parasitic Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: During the past 15 years a marked increase has been noted in the number of cases of malaria imported into the United States from Kenya and Tanzania. In the 10-year period 1962 to 1971, 23 such cases were reported to CDC, while from 1972 to 1976, 40 were reported. Since the World Health Organization has not noted a resurgence of malaria in eastern Africa, it seems most likely that the increased number of imported cases is due to increased tourism in these areas or better reporting.

There is no transmission of malaria in Nairobi, Kenya, and the risk of acquiring the disease is low in the Central, Rift Valley, Eastern, Nyanza, Western, and Coast Provinces. In other areas of Kenya, however, and in Tanzania, the risk of acquiring malaria is greater. Thus, persons taking part in safaris to these 2 countries are exposed to malaria during at least part of their visit and should take medication to prevent malaria. Chloroquine phosphate, 500 mg orally (300 mg base) once a week beginning 1 week before arrival and continuing for 6 weeks after departure from the malarious area is the regimen of choice. Chloroquine-resistant strains of *P. falciparum* have not been documented in Africa.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE / CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

Director, Center for Disease Control, William H. Foege, M.D.
Director, Bureau of Epidemiology, Philip S. Brachman, M.D.
Editor, Michael B. Gregg, M.D.
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