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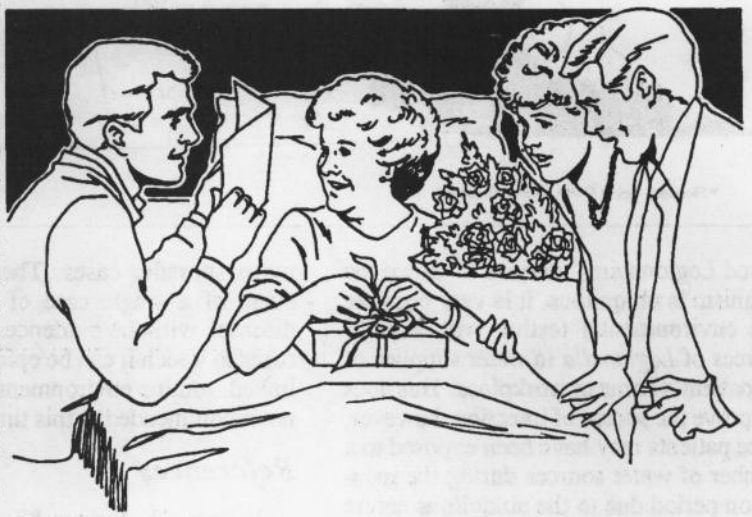
Sporadic Legionnaires' Disease in Virginia*

The gram-negative, aerobic bacteria of the genus *Legionella* are responsible for two very different illnesses, Legionnaires' disease and Pontiac fever. Legionnaires' disease is a multisystem illness of acute onset, commonly characterized by fever, cough, and pneumonia. Myalgia, chills, headache, sputum production, diarrhea and confusion may also be present. Risk factors for Legionnaires' disease include smoking, alcohol abuse, chronic cardiovascular or pulmonary conditions, immunocompromised status, diabetes mellitus, renal disease, increased age, and a history of travel in the two weeks before onset. Males are affected two to three times more frequently than females and case fatality rates range from 5 percent to 30 percent.

Pontiac fever is a self-limited influenza-like illness characterized by fever, chills, myalgia and headache with no pneumonia. Although persons may be quite debilitated for about two to seven days, recovery is complete and there is no associated mortality with this syndrome.

Legionella species are normal inhabitants of lakes, rivers, wet soil, and man-made water sources such as cooling towers, water heaters, shower heads and faucets. However, natural water sources have rarely been implicated as a source of human *Legionella* infections. Transmission of *Legionella* to humans occurs when water containing the bacterium is aerosolized in droplets small enough to be respirable.[1]

In This Issue:



All cases of Legionnaires' disease or Pontiac fever reported to the Virginia Department of Health, Office of Epidemiology, with onset from 1988 through 1992 were reviewed. During this time period, two laboratory confirmed cases of Pontiac fever were reported and 81 cases met the Centers for Disease Control and Prevention (CDC) criteria for confirmed or probable Legionnaires' disease.[2] The characteristics of the 81 Legionnaires' disease cases are summarized below.

Between 10 and 20 cases per year were reported for each year of the five-year period, with no obvious temporal trend. Few cases were reported from the south-central portion of the State (Figure 1). There were no confirmed outbreaks of Legionnaires' disease during this period. Sporadic cases occurred during all months of these years with 40% of all cases occurring from June through September (Figure 2).

Cases ranged in age from 21 to 97 years (mean 56 years) and most (64%) were male. Sixty-two cases (77%) were white, 15 were black (19%), one was Hispanic (1%), with the remainder unknown (4%).

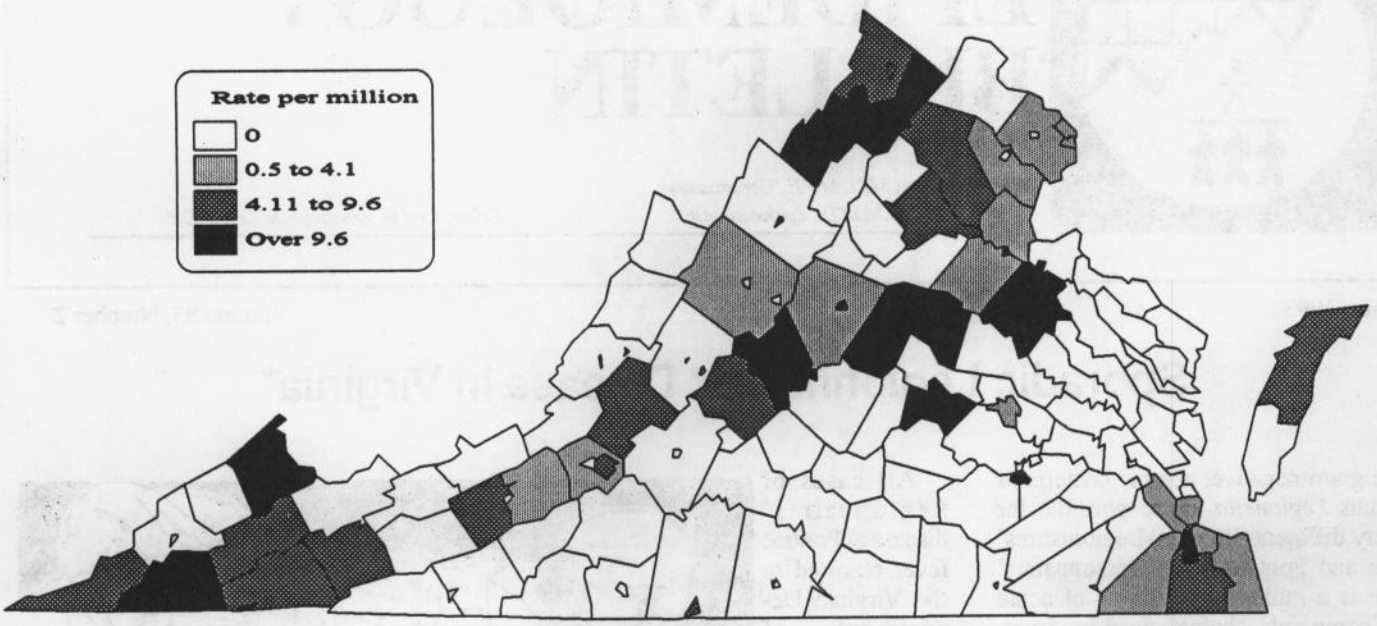
Two-thirds of cases had a positive history for at least one of the following risk factors: cigarette smoking, lung disease, cancer, organ transplant recipient, renal dialysis, diabetes, immunosuppression or alcohol abuse. For those smokers for whom information about daily cigarette consumption was available, all smoked more than one-half pack per day. Ten persons (12%) had none of the above risk factors and for the remaining 17 (21%) no information was available.

Only nine cases (11%) reported overnight travel in the two weeks before disease onset. Thirty-six cases (44%) reported no travel and travel status was unknown for the remaining 36 cases (44%).

Twenty patients (25%) died as a result of Legionnaires' disease, 53 patients (65%) survived, and outcome was unknown for eight cases (10%). The mean hospital stay for both survivors and nonsurvivors was 23 days (n=50). The disease appears to have been nosocomially acquired in 13 patients (16%) who had either been hospitalized for three or more days before onset or who had been discharged from a hospital within the ten days prior to onset.

The question frequently arises whether an environmental investigation is warranted for sporadic cases of community-ac-

Figure 1. Incidence* of Reported Legionnaires' Disease by Locality Virginia, 1988-1992



*Based on 1990 census data

quired Legionnaires' disease.[3-8] Since the organism is ubiquitous, it is very possible that environmental testing will identify sources of *Legionella* in water supplies of the patient's home or workplace. This does not prove the source of infection, however, since patients may have been exposed to a number of water sources during the incubation period due to the ubiquitous nature of *Legionella.* For example, *Legionella pneumophila* has been found in many residences where there have been no infected persons. Furthermore, control measures to remove *Legionella* from water supplies are costly and have not been proven to prevent more sporadic cases. Therefore, in the event of a single case of Legionnaires' disease, without evidence of any other cases to which it can be epidemiologically linked, routine environmental sampling is not recommended at this time.

References

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2. Centers for Disease Control. Case definitions for public Health Surveillance. MMWR 1990; 39(No. RR-13):18.

3. Redd SC, Cohen ML. *Legionella* in water: what should be done? JAMA 1987;257:1221-2.

Table 1. Comparison of the epidemiologic and clinical features of outbreaks of Legionnaires' disease and Pontiac fever

Feature	Legionnaires' disease	Pontiac fever
Attack rate	<1-5%	50-100%
Incubation period	2-10 days	1-2 days
Prominent symptoms	Fever, productive cough, myalgia, chills, headache, chest pain, diarrhea	Fever, chills, myalgia, headache
Lung manifestations	Pneumonia, pleural effusion	Occasional pleuritis
Other organs affected	Kidney, liver, GI tract, CNS	None
Case-fatality ratio	15-20%	0%

Species of *Legionella* Most Commonly Associated with Pneumonia†

- *L. pneumophila* 14 serotypes, 1 and 6 most common. Accounts for approximately 80% - 90% of all cases of both Legionnaires' disease and Pontiac fever.
- *L. micdadei*
- *L. bozemanii*
- *L. dumoffii*
- *L. longbeachae*

†At this time, a total of 34 species have been identified, 16 of which have been implicated with human disease.

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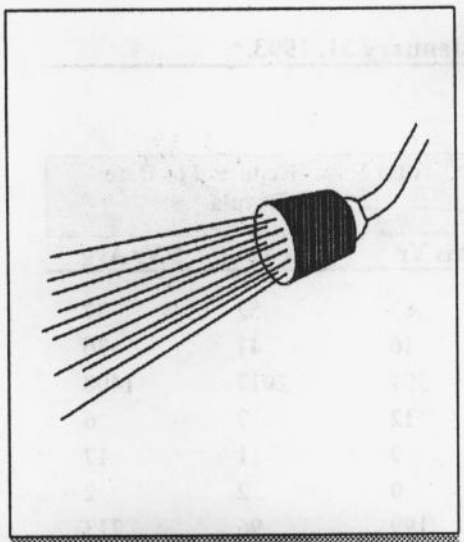


Case Definition for Legionnaires' Disease

Clinical description

An illness with acute onset, commonly characterized by fever, cough, and pneumonia that is confirmed by chest radiograph. Encephalopathy and diarrhea may also be included.

Laboratory criteria for diagnosis

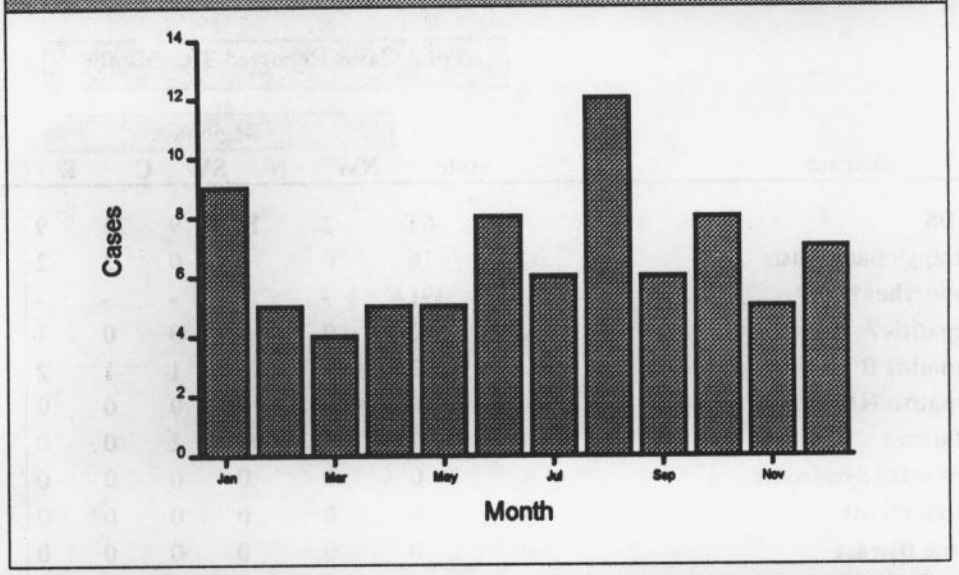
- Isolation of *Legionella* from lung tissue, respiratory secretions, pleural fluid, blood, or other normally sterile sites, or
- Demonstration of a fourfold or greater rise in the reciprocal immunofluorescence (IF) antibody titer to ≥128 (or equivalent result using enzyme immunoassay) against *Legionella pneumophila* serogroup 1 or other *Legionella* species.
- Demonstration of *L. pneumophila* serogroup 1 in lung tissue, respiratory secretions, or pleural fluid by direct fluorescence antibody testing, or
- Demonstration of *L. pneumophila* serogroup 1 antigens in urine by radioimmunoassay.

Case classification

Probable: a clinically compatible illness with demonstration of a reciprocal antibody titer ≥256 from a single convalescent-phase serum specimen.

Confirmed: a case that is laboratory confirmed.

Figure 2. Distribution by month of onset (where known) for reported cases of Legionnaires' disease, Virginia, 1988-1992 (N=80)



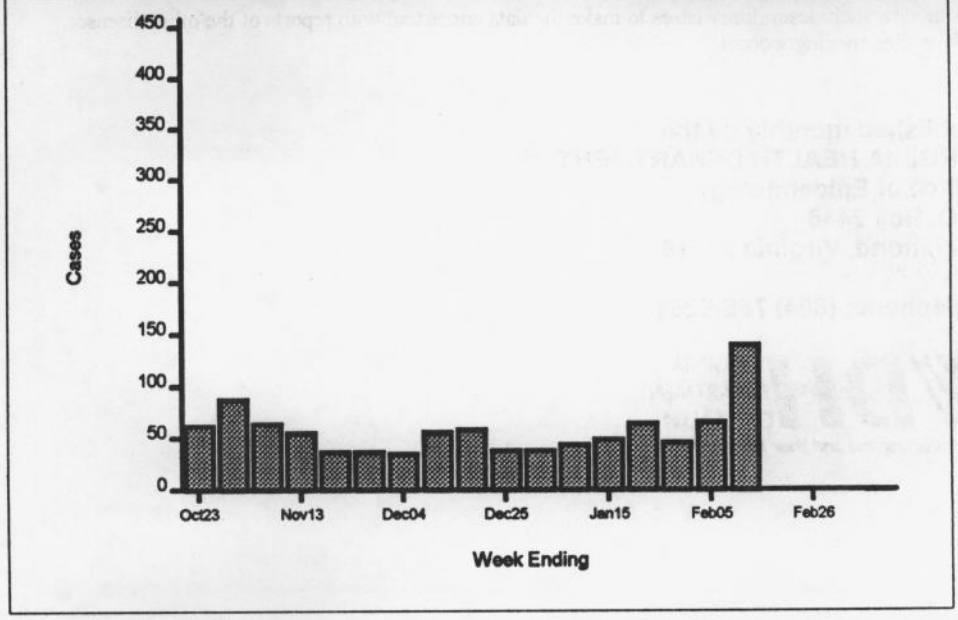
Zoonosis Updates Available From AVMA

The American Veterinary Medical Association recently reprinted 3,000 more copies of the *Zoonosis Updates* book, which was first published in 1990 and was reprinted in 1991. Copies are still available.

The book, which comprises articles published in the *JAVMA* between June 1, 1986 and Nov 1, 1989, has been distributed to more than 6,000 veterinarians, physicians, and public health agencies. Most multiple-copy sales were to veterinary colleges, where the book has become a favored text for public health courses.

Those interested in obtaining a free copy should write to the AVMA Publications Division, 1931 Meacham Rd, Suite 100, Schaumburg, IL 60173-4360. Each additional copy is $4. To place a bulk order, call Mrs. Bernadine Clune at (800) 248-2862, ext 264.

Figure 3. Reports through February 11 of influenza-like illness from sentinel physicians in Virginia (34 offices reporting). Activity in early February continued to be characterized as 'regional.' One influenza type B isolate has been reported from the central region and several influenza type A/Beijing/353/89 (H3N2) isolates have been reported from northern Virginia so far this season.



Cases of Selected Notifiable Diseases, Virginia, January 1 through January 31, 1993.*

Disease	Total Cases Reported This Month						Total Cases Reported to Date in Virginia		
		Regions							
	State	NW	N	SW	C	E	This Yr	Last Yr	5 Yr Avg
AIDS	63	2	18	9	25	9	63	52	37
Campylobacteriosis	16	6	3	0	5	2	16	41	36
Gonorrhea†	391	-	-	-	-	-	391	2017	1408
Hepatitis A	12	0	8	0	0	4	12	7	6
Hepatitis B	9	1	4	1	1	2	9	11	17
Hepatitis NANB	0	0	0	0	0	0	0	2	2
Influenza	199	0	197	2	0	0	199	96	213
Kawasaki Syndrome	0	0	0	0	0	0	0	4	1
Legionellosis	0	0	0	0	0	0	0	1	1
Lyme Disease	0	0	0	0	0	0	0	6	2
Measles	1	0	0	0	1	0	1	0	1
Meningitis, Aseptic	8	0	2	1	1	4	8	11	11
Meningitis, Bacterial‡	1	0	0	0	0	1	1	8	9
Meningococcal Infections	4	1	0	1	1	1	4	3	3
Mumps	4	0	1	1	0	2	4	3	6
Pertussis	0	0	0	0	0	0	0	0	1
Rabies in Animals	33	5	9	5	3	11	33	9	12
Reye Syndrome	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0
Salmonellosis	60	6	9	9	15	21	60	57	76
Shigellosis	11	2	3	0	2	4	11	9	22
Syphilis (1° & 2°)†	44	2	2	3	5	32	44	69	55
Tuberculosis	0	0	0	0	0	0	0	8	16

Localities Reporting Animal Rabies: Appomattox 1 raccoon; Botetourt 1 skunk; Brunswick 1 raccoon; Chesapeake 2 raccoons; Fairfax 3 raccoons; Fauquier 1 raccoon; Henry 1 fox; Hopewell 1 raccoon; James City 1 skunk; Loudoun 6 raccoons; Louisa 1 raccoon; Montgomery 1 skunk; Northumberland 1 raccoon; Powhatan 1 raccoon; Roanoke County 1 raccoon; Rockingham 1 cow, 2 horses; Suffolk 6 raccoons; Virginia Beach 1 raccoon.

Occupational Illnesses: Asbestosis 7; Carpal Tunnel Syndrome 63; Coal Workers' Pneumoconiosis 12; De Quervain's Disease 1; Dermatitis, chemical 1; Lead poisoning 5; Loss of hearing 11.

*Data for 1993 are provisional.

†Total now includes military cases to make the data consistent with reports of the other diseases.

‡Other than meningococcal.

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