

Increasing Plague Activity in Arizona

by Craig Levy, MS

In September, the first plague case in seven years was reported in an Apache County resident with known flea bites. Over the last 30 years, 49 human plague cases have been reported in Arizona. In Coconino County, increased plague activity is likely caused by a plague epizootic among prairie dogs, leading to large die-offs. Since similar activity is likely to occur in other parts of the state, physicians should be prepared to diagnose, treat and report all suspect cases of plague to local or state health officials.

Transmission: Plague, caused by the Gram-negative bacillus *Yersinia pestis*, is transmitted primarily through flea bites. Prairie dogs, ground squirrels, chipmunks, and wood rats are all reservoirs; however, other rodents, rabbits, wild carnivores and domestic cats may be a source of infection to people. Plague can also be transmitted to people by direct contact with blood and tissues of infected animals, such as during the skinning of small game. Pneumonic plague can be transmitted through inhalation of respiratory droplets from infected persons or animals (primarily cats). Such transmission is rare and requires close (within six feet) exposure to a coughing individual.

Clinical Presentation: Clinical illness is often described as bubonic, septicemic, or pneumonic plague, depending upon presentation and primary symptoms. Most cases with flea-bite or direct contact transmission present as bubonic plague which results in local infection that spreads to regional lymph nodes. Common symptoms include sudden onset of painfully enlarged nodes ("buboes"), fever, chills, headache, myalgias and prostration. In some cases, buboes do not develop for several days after onset, making diagnosis more difficult. Without treatment, bubonic plague is fatal in approximately 60 percent of cases.

Septicemic plague can develop without antecedent lymphadenitis. Fever, headache, chills, and myalgias are common but gastrointestinal symptoms, including diarrhea, can also be seen. Hematogenous spread of infection to the lungs and meninges can lead to secondary pneumonic plague, and/or meningitis, respectively. Disseminated intravascular coagulation can also occur, which may lead to peripheral gangrene - hence the name "Black Death" in past plague epidemics. Without treatment, septicemic plague is fatal in virtually all cases. Pneumonic plague symptoms are similar to those of severe pneumonia. Like septicemic plague, pneumonic plague is fatal in virtually all untreated cases. Prognosis is poor in patients who do not receive appropriate treatment within 18 hours after onset of illness.

Laboratory Diagnosis: Made through bacteriologic or serologic tests. Appropriate laboratory specimens include bubo aspirate (whenever possible), whole blood for culture, serum, sputum and CSF (latter two only if indicated). These should be submitted without delay to the Arizona State Health Laboratory. Acute and convalescent sera should be also be obtained for final confirmation.

Treatment: Prompt treatment with appropriate antibiotics is essential (after appropriate specimens are obtained). Streptomycin and gentamicin are the drugs of choice for initial treatment. Chloramphenicol, doxycycline and fluoroquinolones are alternative treatment agents.

Infection Control: Especially critical for suspected pneumonic plague. These cases should be placed in droplet precautions during the first 48+ hours of hospitalization and treatment. Thereafter, standard precautions are sufficient as long as sputum samples have been culture negative for at least 48 hours.

Persons who have had close (face-to-face) exposure to patients with pneumonic symptoms and those exposed to potentially infectious fluids should be given antibiotic prophylaxis with oral doxycycline or ciprofloxacin.

Preventing and Minimizing the Risk of Contracting Plague

1. **Avoid sick or dead animals, especially rodents and rabbits. Do not feed or attract rodents to your home, and eliminate clutter and trash around the home that can harbor rodents.**
2. **Stay away from rodent burrows and nests.**
3. **Report rodent die-offs to your local health department.**
4. **Prevent flea bites by using insect repellents, and tuck pants into boots or socks.**
5. **Do not allow pets to roam, and treat pets with appropriate flea powders or sprays.**
6. **Cat owners in plague enzootic areas should take their ill cat to a veterinarian immediately.**
7. **Hunters and trappers should wear rubber gloves when skinning game.**

References

1. CDC. Human plague -United States, 1993-1994. *MMWR* 1994;43:243-246.
2. Thomas RE. *Y. pestis* virulence characters and transmission events in the ecology of plague. Does *Y. pestis* moderate its own transmission? *Bull Soc Vector Ecol* 1991;16:43-49.
3. Gage KL, Dennis DT, Tsai TF. Plague Prevention in 1996? *ACIP Guidelines (In Press)*
4. Gage KL, Lance SE, Dennis DT, Monteneri J. 1992. Human plague in the United States: a review of cases from 1988-1992 with comments on the likelihood of increased plague activity. *Border Epidemiol Bull* 19:1-10.
5. Craven RB. Plague. In: Hoeprich PD, Jordan MC, and Ronald AR, eds. *Infectious Diseases: A Modern Treatise of Infectious Processes*. 5th ed. Philadelphia: JB Lippincott Co, 1994;1302-1312.
6. Grabman JP. Plague. In: Conn HF ed. *Current Therapy*. Philadelphia: WB Saunders Co, 1985; 50-52.
7. Poland JD, Barnes AM. Plague. In: Steele JH, ed. *CRC Handbook Series in Zoonoses*. Section A, Vol. 1. Boca Raton: CRC Press, Inc., 1979;515-597.
9. Barnes AM. Surveillance and control of bubonic plague in the United States. *Symp Zool Soc London* 1982;50:237-270.
10. Orloski KA, Eidson M. *Yersinia pestis* infection in three dogs. *JAVMA* 1995;207:316-318.



New Data Helps Doctors Educate Patients on Melanoma Risks

by Sharon McKenna

New melanoma data may make it easier for physicians to convince patients they're at risk for developing a potentially fatal skin cancer like melanoma.

In order to compare cancer rates within communities, maps called Community Health Analysis Areas (CHAAs) were created by the Arizona Department of Health Services (ADHS).

The map enables doctors to compare areas around the state to identify skin cancer trends and alert patients to potential risks. It also makes it possible for Arizonans to see where their specific communities rank in terms of how many residents have been diagnosed with melanoma skin cancer. The data compares age-adjusted incidence rates for 1995-2000. (See: <http://www.azdhs.gov/phs/azchaa>)

Arizona's most prevalent melanoma incidence areas include: Paradise Valley, Fountain Hills, Benson, North Scottsdale, and Sedona (see website for complete list). Residents of Paradise Valley have developed melanoma skin cancer at an age-adjusted rate of 45.94 per 100,000—more than triple the national average of 15 per 100,000. Among the state's 126 geographical areas identified, about one-third exceed the national average in melanoma skin cancer rates. This is especially interesting since Gila County had the highest melanoma incidence rate (20.6 per 100,000) from 1999-2001.

The good news is that alerting adults and educating youngsters about sun safety has the potential to lower these rates in the future. Childhood sun exposure is a primary risk factor for developing skin cancer later in life. Detection among adults is equally important. Melanoma rates have increased 150 percent since 1973, according to the Centers for Disease Control and Prevention (CDC). About 90 percent of all skin cancers are associated with exposure to ultraviolet radiation which can be experienced through exposure to the sun as well as sunlamps and tanning booths.

Skin cancer accounts for half of all new cancers and is the most preventable of all cancers by reducing exposure to ultraviolet radiation. But melanoma, which accounts for only four percent of all skin cancers, is responsible for 79 percent of all skin cancer deaths.

Melanoma skin cancer cases rank below cancers of the lung, breast, prostate and colon but are more prevalent than ovarian, uterine, pancreatic, thyroid, kidney, oral cancers and leukemia. Since compiling and comparing cancer data is a lengthy process, the CHAAs maps detail melanoma cancer information from 1995-2000.

LIMIT THE SUN BUT NOT THE FUN! BE "SUNWISE"!

Use Sunscreen Every Day! Wear sunscreen with an SPF of 15 or higher. Apply 15 minutes before going outside and reapply every 2 ½ hours or sooner if perspiring or engaging in water activities.

Wear a Hat and Lip Balm! A hat with a wide brim offers good protection for your scalp, ears, face and the back of your neck. Protect lips with SPF 15+ balm.

Wear Sunglasses! Sunglasses reduce sun exposure that can damage your eyes and lead to cataracts. Check the label and choose sunglasses that block at least 90% of UVA and UVB rays.

Cover Up! Darker colors and fabric with a tight weave provide the most protection.

Limit Time in the Midday Sun! 10 a.m. to 4 p.m.

Check the daily UV Index! The UV index scale is from 1 to 10. Click on the SunWise website below to find your daily UV.

Seek Covered Activities!

Page 2 Avoid Sun Lamps and Tanning Booths!

Register for FREE SunWise sun safety curriculum & other UV stuff at www.azdhs.gov/phs/sunwise. For more information about this article or the SunWise program, contact Sharon McKenna at (602) 364-3143 or (800) 367-6412. You can also email Sharon McKenna at mckenns@azdhs.gov.

This publication is supported by a Preventative Health and Health Services Block Grant from the Centers for Disease Control and Prevention (CDC). Its contents do not necessarily represent the views of the CDC. If you need this publication in alternative format, please contact the ADHS Public Information Office at 602.364.1201 or 1.800.367.8939 (State TDD/TYY Relay).