Department of State Health Services
Health Services Region 7

Epidemiology & Surveillance Quarterly Newsletter

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Oseltamivir Resistance in Influenza A in Texas

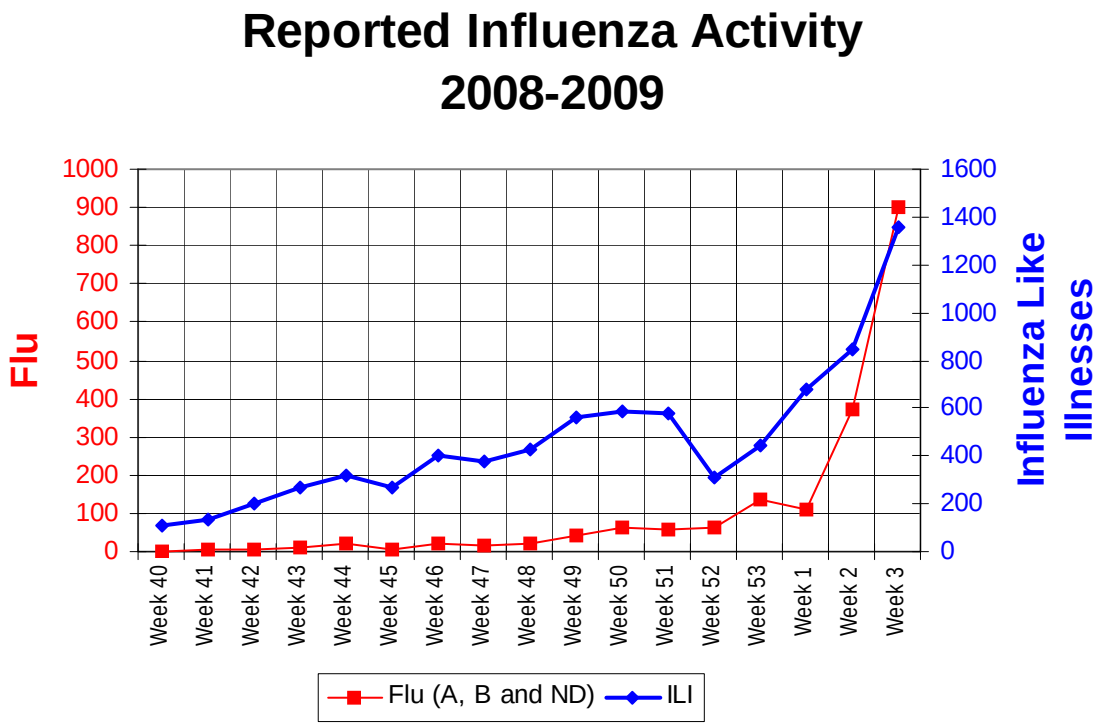
In December, the Centers for Disease Control and Prevention (CDC) released interim recommendations regarding oseltamivir resistance in influenza A viruses. These recommendations are relevant to Texas for 2008-2009 flu season. Of the 11 Influenza A/N1 specimens from Texas that have been tested for antiviral resistance this season, 10 were found to be resistant to oseltamivir. Health care providers are advised to consider the new interim recommendations for antiviral use when treating individuals with influenza A. The full CDC advisory can be accessed at http://www.cdc.gov/flu/professionals/antivirals/index.htm.

The CDC advisory encouraged physicians to use a flu test that distinguishes between influenza A and B. It also provides recommendations for the treatment of influenza.

Flu on the Rise in Region 7

Region 7 receives voluntary influenza and influenza like illness reports from health care providers and school nurses. Reports of influenza and influenza like illness have increased dramatically in the last few weeks in Region 7. It is common for influenza and influenza like illness to peak in January/February in Texas. Weekly reports for Texas can be found on the DSHS website at

http://www.dshs.state.tx.us/idcu/disease/influenza/surveillance/2009/ .



It is not too late to get your flu vaccination!

In Texas, all (100%) of the fourteen (14) Influenza A/H1 viruses characterized have matched the A/H1 component of this season vaccine. We have not had any Influenza A/H2 viruses characterized this season; however of those characterized by the CDC, 100% matched the A/H3 component. Of the eleven (11) influenza B viruses characterized in Texas, one (1) or nine percent (9%) matched the influenza B component of the vaccine.

Preventing Pertussis (Whooping Cough)

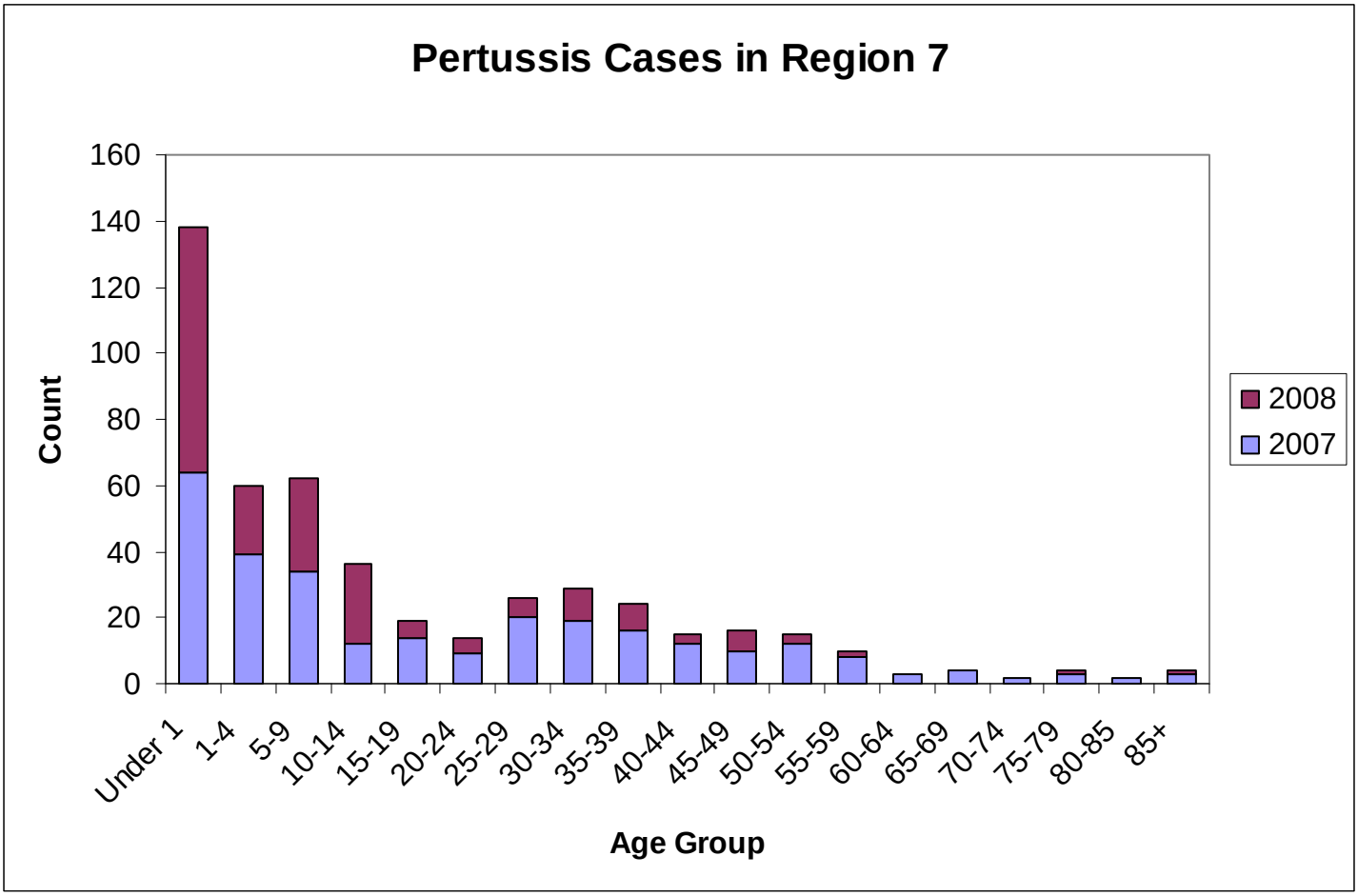
Pertussis is a bacteria that infects infants, children, adolescents and adults. The bacteria makes several toxins, causing people to have thick, sticky mucus that clogs the windpipe and causes painful spasms of coughing. When people breathe in against their narrowed windpipe, it may cause a whooping sound, which is why pertussis is also known as whooping cough. Coughing spasms make it difficult to breathe, eat or drink. People with a cough lasting for several weeks may be infected with Pertussis.

Young infants are particularly at risk because of their small windpipes. Since adults are known to pass the disease to children, it is important for us to adopt the "cocooning" theory where adults and family members are immunized as a means of protecting infants who are too young to have completed their vaccinations. **While most diseases are passed from children to adults, pertussis is often transmitted in the opposite direction, from adults to children.**

In the United States that are 15 to 20 deaths from pertussis reported each year, most in infants who are too young to be completely vaccinated. Many cases of pertussis result when grandparents, parents, siblings, aunts, uncles, day care workers, and babysitters unknowingly transmit the disease to unprotected newborn babies that they know and love. Pertussis is often misdiagnosed as asthma or bronchitis in adolescents and adults and until an infant is hospitalized with this horrendous disease, it goes unnoticed.

Tdap vaccine will help protect infants if the adults around them are vaccinated. Adults who have received a tetanus shot (Td) at least 5 years ago should receive a Tdap vaccine (provided they are under age 65) as soon as possible. Adults who have previously received a Tdap should not receive another one but a Td booster should be given every 10 years.

Article by Dianne Romnes, Health Services Region 7



Typhus in Travis County, 2008

Introduction

Murine typhus is a rickettsial disease maintained in nature by the rat-flea-rat cycle, rats (*Rattus Rattus and R. norvegicus*), mice, and other small mammals are reservoirs. Rats can have asymptomatic illness. The infectious agent is Rickettsia typhi and is transmitted to humans when an infected flea (usually *Xenopsylla cheopis*) bites and feeds off a human. Humans are exposed from flea feces entering the bite site or other open wounds. Incubation period for humans is 1 to 2 weeks, commonly 12 days. Symptom onset is often sudden with headache, chills, fever, malaise, and myalgia. Approximately 50% cases will develop a macular rash typically on the trunk followed by spread to the entire body, but usually not on the palms or soles. Some cases can experience more severe symptoms requiring hospitalization. Severity of disease increases with age. Antimicrobial treatment includes doxycycline or chloramphenicol. Early diagnosis and treatment is the key to medical management of murine typhus. Natural illness infers long lasting immunity. Since the advent of antimicrobials, the case fatality rate for murine typhus has dropped to 1%.[1]

In the early 1940s, the Centers for Disease Control and Prevention (CDC) reported between 2,000 – 5,000 annual cases of murine typhus in the United States. Most cases were from Southeastern and Gulf Coast states. The institution of rat control programs after World War II led to a decline in cases. In the early 1980s, the CDC reported between 60 – 80 annual cases. Approximately 80% of these cases were from Texas.[2] In 2006, Texas reported 141 murine typhus cases, with all but 3 cases occurring in thirteen south Texas counties. Texas has passive reporting for typhus and in 2005 CDC implemented a Bi-national Infectious Disease Surveillance (BIDS) program to enhance the existing passive reporting. Epidemiology in Texas 2006 Annual Report addresses murine typhus illness as mild but can persist for several months with up to 10% of infected adults requiring hospitalization. [3]

In 2008, Austin Travis County Health and Human Services Department (ATCHHSD) Disease Surveillance staff investigated a total of 50 typhus reports and 33 met the investigation case definition of fever and headache, rash, or myalgia accompanied by laboratory evidence of illness. Travis County reported two cases in 2007. Prior to 2007, Travis County had not reported any cases of murine typhus during the previous ten years. By the end of June 2008, Travis County had six cases of murine typhus. Texas Department of State Health Services (DSHS) was consulted. With 5 additional cases reported during the last two weeks of July, DSHS and CDC agreed to assist ATCHHSD with the investigation into Travis County typhus cases. A notice to area physicians and medical providers requesting them to look for missed and new typhus cases aided the investigation.

Description of Human Cases

Of the 33 cases reported to ATCHHSD, most were over the age of 18 (Table 1). The average age of the cases was 39. Cases ranged from 7 to 64 years with median age of 39 years. Male cases were slightly higher with 18 (55%) than female cases with 15 (45%). Twenty-four (73%) cases were non-Hispanic, 3 (9%) were Hispanic and 6 (18%) were of unknown ethnicity.

Using the case definition, the cases had the following symptoms: fever 33 (100%), rash 14 (42%), headache 25 (76%) and myalgia 23 (70%). (Table 2**)**. All had laboratory evidence of infection. Other symptoms reported, listed by frequency from highest to lowest were: chills, fatigue, loss of appetite, nausea, vomiting, diarrhea, malaise, joint aches, photophobia, backache, stiff neck, cough, abdominal pain, conjunctivitis, jaundice and swollen lymph nodes. Severe symptoms reported were pneumonia/adult respiratory distress symdrome, confusion, renal failure, coagulopathy, delirium, blurred vision, trouble swallowing, trouble speaking, and seizure. Laboratory evidence of illness included polymerase chain reaction (PCR) and Rickettsia typhi IgG or IgM antibody IFA. One case had positive PCR results for Rickettsia typhi, testing was completed by the Rickettsial Zoonosis Branch Diagnostic Laboratory at the CDC in Atlanta, Georgia.

Table 2: 2008 Typhus Symptoms

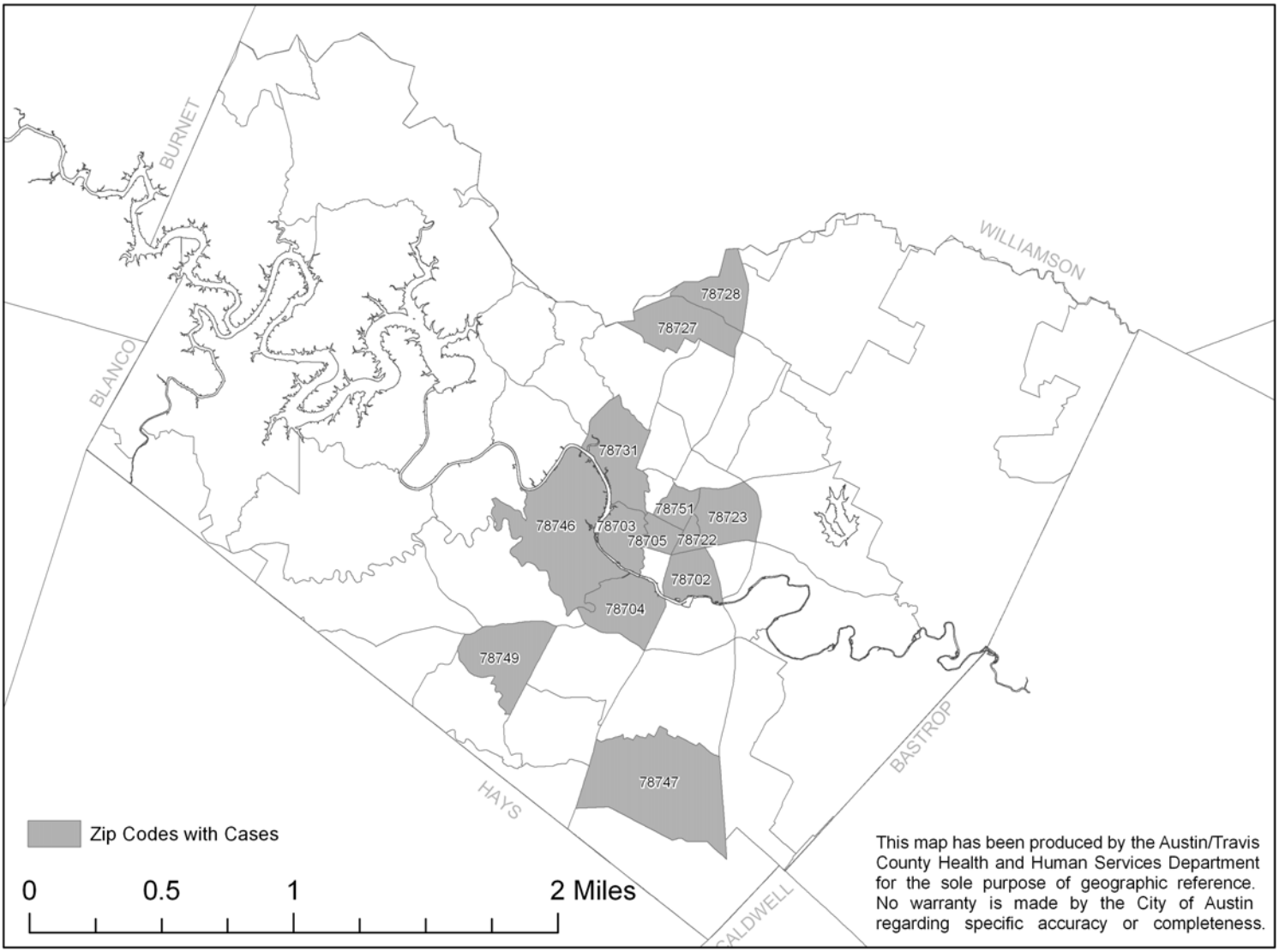
Symptoms	Count	% of Cases
Fever	33	100
Rash	14	42
Headache	25	76
Myalgia	23	70

Table 1: 2008 Murine Typhus Demographics in Travis County

Age		
Mean	39	
Median	39	
Range	7 to 64	
Category	**Count**	**%**
Age Group		
≤ 18	6	18
19 to 24	1	3
25 to 44	12	36
45 to 64	14	43
≥ 65	0	0
Total	33	100
Gender		
Female	15	45
Male	18	55
Total	33	100
Ethnicity		
Hispanic	3	9
Non-Hispanic	24	73
Unknown	6	18
Total	33	100
Hospitalized		
Yes	23	67
No	10	33
Total	33	100

Typhus Continued

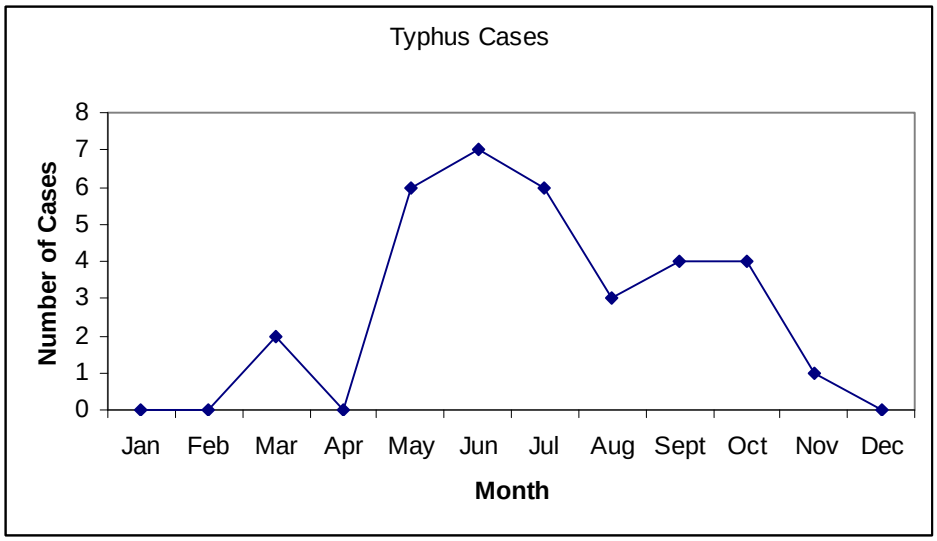
Figure 1: Travis County Zip Codes with Murine Typhus Cases--2008



Cases of murine typhus were reported from thirteen zip codes in Travis County (Figure 1). Seven of these 13 zip codes only had one case. The majority of the cases, 12 (37%), were from one urban zip code. An adjacent zip code had the second highest number with 5 (15%) cases.

Nineteen (57%) cases had illness onset in summer months of May, June and July (Figure 2). The request to area physician to report new and missed cases sent out at the end of July helped to identify additional cases that might not have been diagnosed or reported.

Figure 2: 2008 Murine Typhus in Travis County by Month of Illness Onset



Typhus Continued

Environmental Assessment

Murine typhus, while endemic in south Texas, had not been reported in Travis County during the 10 years prior to 2007, therefore an environmental assessment was conducted. CDC led the combined efforts of CDC, DSHS, and ATCHHSD in the environmental investigation. Preliminary case interviews and geographical proximity of the cases to one another suggested exposure to the disease agent occurred at place of residence. A detailed environmental investigation was conducted during a two week period in August 2008 to identify any associated risk factors for disease exposure in Travis County. The investigation included an external assessment of case households and the testing of any domestic animals, wildlife, and ectoparasites present in the area. Environmental site assessments (ESA) included evaluation of external housing structure, building materials, vegetation, water features, food sources, and evidence of the presence of wildlife. Additional information was also obtained directly from cases when possible on the internal and external use of pesticides, domestic animals present, the use of flea- and tick-control products on pets, history of flea infestations, and any evidence of rodents or other types of wildlife in or around the property. Domestic animals of consenting cases were tested, combed for fleas, and specific pet information collected. Wildlife around the homes of consenting cases were trapped, tested, combed for fleas, assigned identification information, and released within the general area where they were trapped. Rodents and other wildlife that were captured by individuals and organizations trapping animals in the investigation zip codes were also accepted. All specimens from domestic animals and wildlife were collected at Town Lake Animal Center facilities, appropriately stored, and transported daily to DSHS laboratory. DSHS packaged and shipped the specimens to the Rickettsial Zoonosis Branch Diagnostic Laboratory at the CDC in Atlanta, Georgia. The specimens were tested for *R. typhi* and *R. felis* by serology, polymerase chain reaction or culture, as well as ectoparasites identified to species by the CDC. [4]

Findings from the environmental assessments included:

- Sixteen household ESAs were performed with 13 of these households completing a detailed questionnaire. Two other ESAs were performed at households of non cases (DSHS employees) in the investigation zip codes.
- Twelve households reported owning pets, 8 of which consented for their pets to be tested. Pets included 5 cats and 10 dogs. Four fleas were collected from 3 of the dogs and identified as *Ctenocephalides canis.*
- Twelve feral cats were provided for testing by a local Humane Society chapter. All feral cats had zip code location information provided. Thirty fleas from 11 of feral cats were collected and identified as *Ctenocephalides felis.*
- Thirty-two wild animals were captured and sampled from 6 zip codes. Captured wildlife included 4 rats, 10 raccoons, and 18 opossums. Seventeen (52%) of the animals were captured from within the same zip code in which 36% of the human cases had occurred at the time of environmental assessment in August. One hundred fifteen fleas were collected from 26 of wild animals;1 rat, 7 raccoons and 18 opossums. Flea identification as follows:
    - from rat: 1 *Ctenocephalides felis*
    - from raccoons: 8 *C. felis,* 1 *Echidnophaga gallinacean,* 5 *Pulex irritans,* and 2 *Xenopsylla cheopis*
    - from opossums: 84 *C. felis,* 14 *P. irritans*
- Fifty-seven animals had serum or plasma tested for evidence of seroreactive antibodies to *R. typhi* antigens by immunofluorescence assay (IFA), specimens included 17 cats, 9 dogs, 18 opossums, 9 raccoons and 4 rats. Over all 19 (33.3%) animals tested positive for illness; including 3 (17.7%)cats , 4 (44.4%) dogs, and 12 (66.7%) opossums. None of the samples from raccoons or rats were positive (Table 3). IFA positive titers range from 1:32 up to $\geq$ 1:4096. No evidence of either *R. typhi* or *R. felis* DNA was detected in any of the flea or animal specimens tested.
- Positive animals came from 5 different zip codes with 68% of all positive animals coming from 2 zip codes. The 3 positive cats were from a single address. The 4 positive dogs were owned by 3 different people from 3 different zip codes. Twelve positive opossums were from 3 zip codes and 8 different addresses. [4]

Table 3: 2008 Murine Typhus Animal Test Results

Animal	Number Tested	Number Positive	% Positive
Cats	17	3	17.6
Dogs	9	4	44.4
Opossums	18	12	66.7
Raccoons	9	0	0
Rats	4	0	0
Total	57	19	33.3

Typhus Continued

Environmental information collected from interviewing human cases included presence of household pets (specifically dogs or cats), observation of the presence of wildlife including rodents, and recall of flea bites. If the case couldn't reminder if he/she had any fleabites, it was recorded as unknown. The presence of pets, 27 (82%), and observed wildlife, 21 (64%), were two important environmental observations identified in the investigation (Table 4).

Table 4: 2008 Environmental Assessment Results

Factor Present	Yes (%)	No (%)	Unknown (%)
Pet (dog or cat)	27 (82)	5 (15)	1 (3)
Wildlife	21 (64)	7 (21)	5 (15)
Rodents	8 (24)	15 (46)	10 (30)
Flea bite	3 (9)	17 (52)	13 (39)

Conclusion, Preventative & Control Measures, Now and into Future

Laboratory evidence of murine typhus in Travis County was demonstrated in both humans and animals during this investigation. Why this illness has emerged in Travis County is still unknown. We do know that murine typhus is transmitted to humans via an infected flea bite. Recommendations outlined here are effective in minimizing potential human exposure to *R. typhi* infections:

- Use veterinarian approved flea and tick control products on your pets
- Keep areas where your pets sleep, play and eat clean to reduce materials needed for flea development
- Keep yards and homes free of fleas using appropriate pesticides
- Prevent wildlife and feral cats from entering your home by closing openings around your home, covering trash cans, and not leaving uneaten pet food out that may attract rodents and other animals
- Keep yards groomed and clear of heavy undergrowth and debris to reduce animal nesting
- Avoid areas that may be infested with fleas. You should use insect repellants containing DEET if your activity could expose you to fleas
- Avoid interaction with feral cats and wildlife
- If rodents or wildlife nest either inside or outside and need to be removed, consult with commercial pest control agency or local health department to safety address problems. [4]

Continued surveillance of human typhus cases in Travis County will continue in 2009 and future years. Reporting of typhus will aid Austin Travis County Health and Human Services Department to best serve our community and reduce occurrences of disease. If you have any questions about typhus in Travis County, contact ATCHHD at 512-972-5555. Residents of Austin / Travis County can contact 512-972-5692 for information about protecting your yard and home from rodents.

References:

[1] Control of Communicable Disease Manual, 18th Edition, pages 583- 587.

[2] Center for Disease Control and Prevention. *Outbreak murine typhus – Texas*. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/00001270.htm Accessed January 18, 2009.

[3] Texas Department Health Services Department. *Epidemiology in Texas 2006 annual report: murine typhus in Texas 2006.* Available at: http://www.dshs.state.tx.us/idcu/data/Annual/2000s/2006/ . Accessed January 18, 2009.

[4] These findings have recently been corroborated (K. McElroy, DVM, unpublished data, September 2008).

Article by Jill Campbell, RN Austin Travis County Health and Human Services Department

Annual Diseases in Nature Conference

The James Steele Conference on Diseases in Nature Transmissible to Man (DIN) opens at 1:00 pm on Tuesday June 2, 2009, and will continue until noon on Friday, June 5, 2009 at the Hilton Fort Worth.

DIN focuses on zoonoses of interest to health professionals in the southwestern United States. Participants include physicians, physician assistants, nurses, veterinarians, epidemiologists, virologists, microbiologists, parasitologists, entomologists, sanitarians, public health professionals, wildlife biologists, animal control officers, and other public health professionals involved in the diagnosis, investigation, and prevention and control of infectious zoonotic diseases. Presentations range from scientific advances to overviews of field investigations. Past presentations are available to view at http://www.dshs.state.tx.us/idcu/health/zoonosis/education/conferences/din/

Registration information on the 2009 conference is forthcoming and will be posted at http://diseasesinnature.googlepages.com/

National Salmonellosis Outbreak

The Centers for Disease Control and Prevention is leading an investigation into a national outbreak of *Salmonella* Typhimurium. As of January 25, there have been 501 cases in the United States; 6 of which are in Texas. Of the Texas cases, only 1 is from Region 7. Certain brands of peanut butter and peanut butter containing products are suspected as the source of the outbreak. Not all peanut butter brands are implicated. At this time, the source appears to be limited to peanut butter paste and King Nut peanut butter from the Peanut Corporation of America in Georgia. King Nut peanut butter is not sold directly to consumers. It is distributed to institutions, food service providers, food manufacturers and food distributers. Certain peanut butter crackers that use peanut butter paste from the Peanut Corporation of America have also been implicated. The FDA has a searchable database to check which peanut butter products are potentially involved at http://www.accessdata.fda.gov/scripts/peanutbutterrecall/index.cfm

Information on the outbreak can be found on the CDC website at http://www.cdc.gov/salmonella/typhimurium/

Access to the New England Journal of Medicine

One of the benefits to signing up on the Texas Public Heath Information Network is free, online access to the New England Journal of Medicine. You can register for access to the PHIN at https://texphin.dshs.state.tx.us/.

To access the New England Journal of Medicine on the PHIN:

1. Go to https://texphin.dshs.state.tx.us/
2. Log into the PHIN using your user name and password
3. Under the drop down menu TXPHIN links, select NEJM
4. The journal should open in a new window

Select Notifiable Conditions Reported in 2006 , 2007 and 2008

Notifiable Condition	2006 Count	2007 Count*	2008 YTD Count*
Amebiasis	30	61	85
Aseptic meningitis	270	278	285
Bacterial meningitis, other	18	24	31
Brucellosis	2	5	1
Campylobacteriosis	146	275	194
Cruetzfeldt-Jakob Disease	2	0	0
Cryptosporidiosis	109	37	366
Cyclosporiasis	1	0	0
Ehrlichiosis, Human monocytic	1	0	0
Enterohemorrhagic *E.coli* O157:H7	9	0	0
Enterohemorrhagic *E.coli*, shiga + (not serogrouped or non-O15:H7 serogroup))	10	11	17
Group A Streptococcus, invasive	57	44	56
Group B Streptococcus, invasive	76	52	86
Haemophilus influenzae, invasive	1	0	1
Hepatitis, unspecified	75	2	28
Hepatitis A, acute	23	28	20
Hepatitis B virus infection, Chronic^	241	231	392
Hepatitis B, acute	55	67	48
Hepatitis C Virus Infection, chronic or resolved^	2025	1284	1676
Hepatitis C, acute	3	6	7
Hepatitis E, acute	0	2	1
Legionellosis	8	6	8
Leishmaniasis~	~	2	0
Listeriosis	1	3	7
Lyme disease	5	11	10
Malaria	9	20	13
Mumps	15	2	2
Neisseria meningitidis, invasive (Meningococcal disease)	7	9	10
Pertussis	337	274	187
Plague	1	0	0
Q fever	3	8	4
Rocky Mountain spotted fever	2	2	4
Salmonellosis	366	400	639
Shigellosis	388	252	237
Streptococcus pneumoniae, invasive	129	224	262
Streptococcus, other, invasive, beta-hem (non-A nonB)^	15	12	7
Typhoid fever (*Salmonella typhi)*	0	2	4
Typhus fever	0	2	33
Vancomycin-Resistant Enterococcus	5	5	1
Varicella (Chickenpox)	1728	1224	1035
Vibriosis	12	3	5
Yersiniosis	3	5	3
Grand Total	6190	4873	5765

Includes confirmed and probable notifiable conditions reported to the Texas Department of State Health Services Region 7 that are tracked in the NEDSS database. Year to Date (YTD) for 2008 includes cases reported and entered from January 2008 through December 2008. Additional cases may be entered/updated.

* Data is provisional and may change as investigations are completed or updated.

^ Disease is not reportable. Note: Newly reported chronic Hepatitis C was taken off of the notifiable conditions list as of June 5, 2007.

~ Disease was added to the notifiable conditions list in 2007.

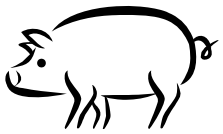
Public Health Information Network (PHIN)

Between October and December, 2 PHIN messages were sent out to physicians, nurses and area hospitals in Region 7 counties. These messages contained information from the Centers for Disease Control and Prevention and/or the Texas Department of State Health Services regarding ongoing health investigations with the potential to impact Texans. The PHIN provides a secure format for sharing critical health information that may contain sensitive health information. PHIN messages are sent by email, phone or fax depending on the importance or time sensitive nature of the message.

Didn't get the alerts?

Healthcare providers, school officials, emergency medical services and emergency management coordinators are eligible for PHIN access. Go to https://texphin.dshs.state.tx.us/ to sign up to use the PHIN. In addition to getting critical health information from the Department of State Health Services, PHIN users can also assess the New England Journal of Medicine through the PHIN web portal. If you have any questions about the PHIN, call 254-778-6744 and ask to speak with Carol Davis, Jacque Hagerty or Russ Jones.

Region 7 Outbreaks, Clusters and Other Large Investigations; Oct — Dec 2008



In October, a 14 y/o from Bell County was diagnosed with influenza. The specimen was forwarded to the DSHS lab and then to the CDC lab for analysis. The CDC notified DSHS that the 14 y/o was infected with an H1N1 strain found in swine. Swine flu viruses do **not** normally infect humans. However, sporadic human infections with swine flu have occurred. Investigation revealed that the 14 y/o had close contact with pigs, including one pig that had flu like symptoms. There is no indication of human to human spread. Both the 14 y/o and the pig have recovered. This appears to be a single isolated case. Information on swine influenza can be found at http://www.cdc.gov/flu/swine/index.htm

In November, Region 7 jointly investigated an outbreak of foodborne illness with Austin/Travis County Health and Human Services Department (ATCHHSD). The principal of a school in Travis County reported that ~27 students and teachers had symptoms of vomiting after attending an overnight camp in Burnet County. Although no lab tests were positive, the symptoms were consistent with norovirus. Investigation demonstrated that eating finger-food items was associated with and increased chance of illness.

In December, Bell County Public Health District investigated an outbreak of gastrointestinal (GI) illness at a nursing facility. Out of 216 residents, 30 have had GI symptoms and 5 were hospitalized. The symptoms are consistent with a norovirus like illness. At the guidance of the local health department, the nursing home implemented infection practices such as cohorting sick/well residents, restricting activities and limiting visitors.

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Past editions can be found at http://www.dshs.state.tx.us/region7/Epidemiology.shtm