Prevention bulletin
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West Nile Virus Spreads Across Country, Likely to be Found in Arizona Soon

By Craig Levy

This year was characterized by significant West Nile virus (WNV) activity throughout most of the country. As of October 17, more than 3,100 clinical cases of WNV infection including over 170 deaths were reported in the United States. Human cases were reported in 37 states.

This new mosquito-borne virus spread across the country at an unprecedented rate in 2002. Evidence of WNV activity (laboratory positive birds, mosquito samples, sentinel chicken bloods, horses and/or human cases) has been found in 43 states. Arizona is one of only five among the 48 contiguous states that has not yet documented in-state WNV activity. However, WNV was identified as the cause of meningitis in three Arizona residents with travel/exposure histories in other states: Indiana, Missouri, Michigan, and Ohio. WNV infection was also confirmed in a horse in Pima County with an exposure history in Minnesota.

In preparation for the inevitable arrival of WNV in Arizona, state and county health officials in Arizona have enhanced surveillance efforts for the past three years to detect and respond to the WNV. Health officials have established a surveillance network in all 15 counties. As of October 9, 2002, the Arizona State Health Laboratory (ASHL) tested over 600 mosquito pools, 1,200 sentinel chicken blood samples, and 100 human specimens (serum and/or CSF). All were negative for WNV except for the aforementioned humans and horse. In addition, the University of Arizona's Veterinary Diagnostic Laboratory tested over 160 dead birds. All were negative for WNV.

Surveillance efforts did detect other arboviruses, however. A total of 28 mosquito pools tested positive: 14 for St. Louis encephalitis (SLE) virus (Yuma, Maricopa, Pima and Pinal counties), and 14 for western equine encephalitis (WEE) virus (Yuma, Pinal, Maricopa and Mohave counties). Twenty-seven sentinel chickens seroconverted to arboviruses, 16 to SLE (Yuma,

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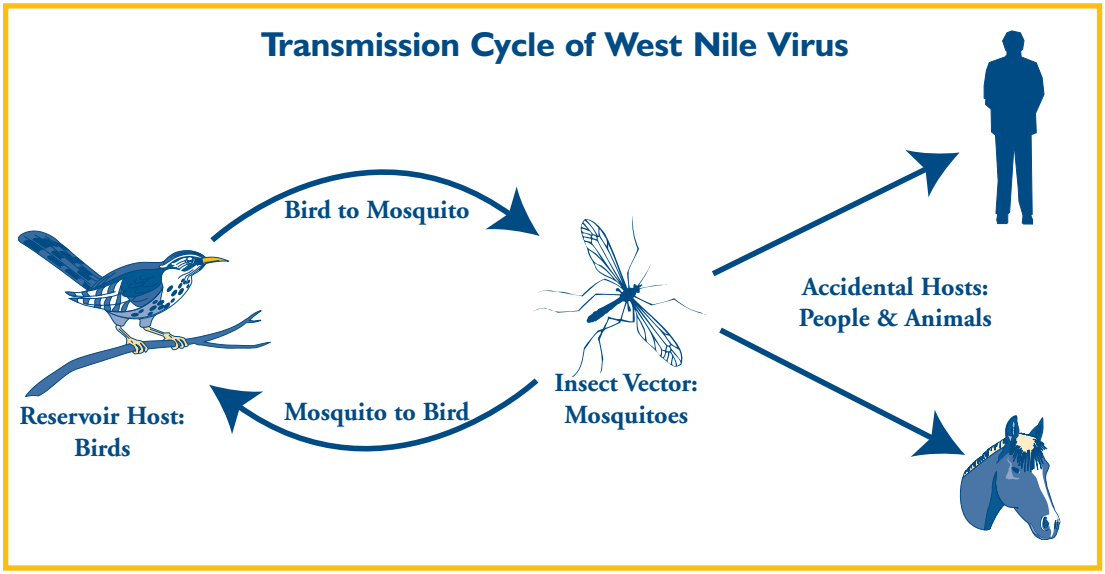
Transmission Cycle of West Nile Virus



Arizona Department of Health Services

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Cases of Valley Fever Continue to Rise

By Ken K. Komatsu, M.P.H.

Reports of coccidioidomycosis continue to increase in Arizona. In 2001 there were 2,301 reported cases (43.4 cases per 100,000 population) and 2,294 reported cases as of October 1, 2002. This would project to a total of 3,059 cases in 2002 (Figure 1).

Seventy-five percent of the cases occurred in Maricopa County (53.9 per 100,000), which exceed the rates for Pinal and Pima County for the first time in 10 years (Figure 2).

Demographic characteristics of persons reported with coccidioidomycosis disease have remained fairly stable. Persons over 65 years of age had double the rate (83.6 per 100,000) compared to those between ages 20 and 44 (42.6 per 100,000). During 2001, Males were 1.4 times more likely than females to be reported with coccidioidomycosis (Figure 3).

Rates in 2001 for all races were comparable with the exception of Native Americans who were 50% less likely to be reported with coccidioidomycosis than Whites. Seasonal spikes in incidence of coccidioidomycosis continue to be noted between May and July and between November and December.

Immigration of susceptible residents, a growing immunosuppressed population, changing climatic conditions affecting *Coccidioides immitis* growth and sporulation, construction and development of previously undisturbed desert lands, and better reporting may all have contributed to the increase in reported cases. In response, the Arizona Department of Health Services has enlisted the aid of the Centers for Disease Control and Prevention to assess the morbidity associated with increased reporting of coccidioidomycosis, identify environmen-

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Figure 1

Reported Cases of Coccidioidomycosis in Arizona by Year of Report

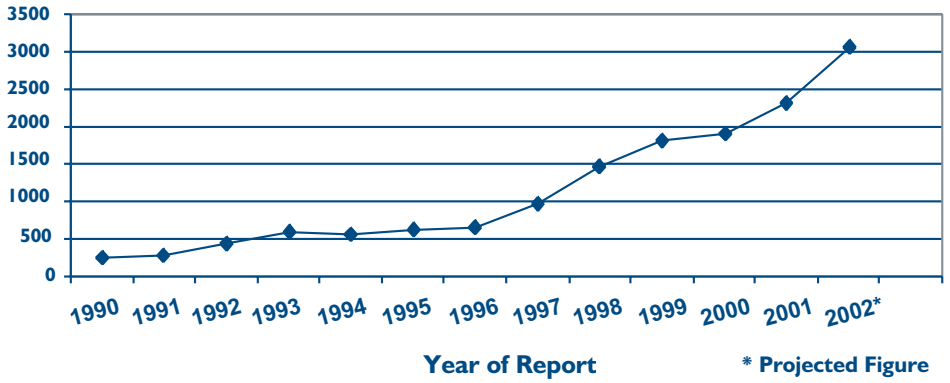


Figure 2

Coccidioidomycosis in Arizona, 2001

Based on the earliest data present. (Onset, Diagnosis or Report) and (estimates from) 2000 Census data

Key:
Counties Reported Cases
Rate per 100,000

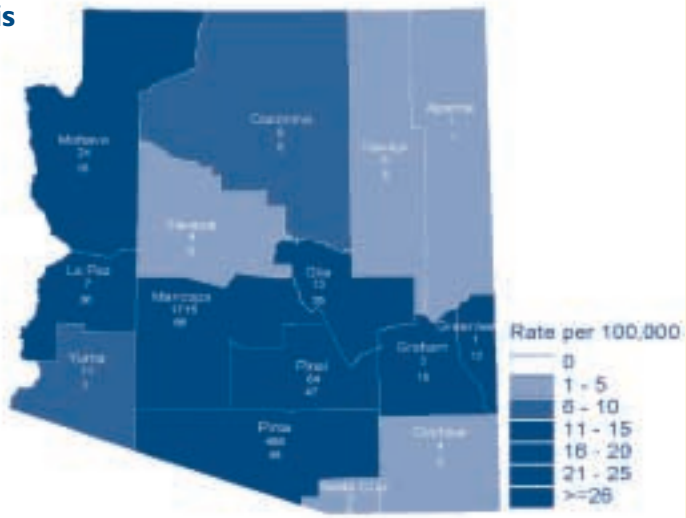
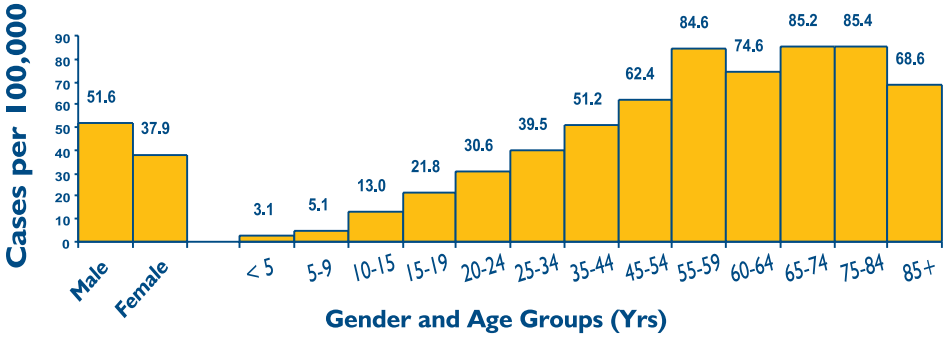


Figure 2

Gender & Age Specific Rates of Reported Coccidioidomycosis in Arizona, 2001



Norwalk-Like Viruses – Common Cause of Gastroenteritis Outbreaks

By Cheryl McRill, M.D., Victor Waddell, Ph. D., and William Slanta

Norwalk-Like Viruses (NLV) cause approximately 23 million cases of gastroenteritis each year and account for 96% of all non-bacterial gastroenteritis outbreaks according to data from the Centers for Disease Control and Prevention (CDC).

NLV were recently associated with an outbreak of diarrheal illness among river rafters in the Grand Canyon, gastroenteritis among participants in a Phoenix youth golf tournament, several nosocomial outbreaks of gastroenteritis in hospitals in the United Kingdom, and two consecutive Alaskan cruises on the same ship in which 13-14% of passengers on each cruise developed vomiting and/or diarrhea. Each of these outbreaks was dramatic and highly publicized, but outbreaks of gastroenteritis due to NLV are quite common and often go unrecognized.

NLV viruses are a group of related viruses named for the group's prototype which was identified as the cause of an outbreak of gastroenteritis in Norwalk, Ohio in 1972. Previously referred to as "small, round-structured viruses" for their electron microscope appearance, they are now placed in the viral family Caliciviridae. Serologic studies have shown that antibodies to this viral group are likely to be acquired in early childhood and seropositivity may range from 50-90% in older children and adults. Unfortunately, antibodies do not provide long-lasting protection from recurrent infection.

Clinical Presentation

Sometimes called "stomach flu" or "winter vomiting disease," the illness caused by NLV actually occurs year-round. It is self-limited and brief, lasting only 2-3 days. Serious illness is unusual, although vomiting and diarrhea may be profuse. Either vomiting or diarrhea may be present alone, but usually both occur together.

Physicians can play an important role in public health by suspecting NLV when the clinical presentation is compatible.

Other symptoms sometimes seen include myalgia, malaise, headache, and low-grade fever. Onset may be either abrupt or gradual after an incubation period which is usually 1-2 days (range 18 to 72 hours). Stools are non-bloody, not mucousy, and do not contain fecal leukocytes. The peripheral white blood cell count is usually normal or slightly elevated. Other clinical laboratory tests are non-contributory. Diagnosis may be made by demonstrating a rising titer between acute and convalescent serologies, but more often it is based on the clinical course and exclusion of other etiologies. As with other viral gastroenteritides, treatment is supportive to prevent dehydration.

There is no vaccine or specific treatment.

Low Infectious Dose

NLV is highly contagious with an infectious dose estimated at less than 100 virons and may be shed in stools up to two weeks after resolution of symptoms. Not surprisingly, outbreaks of NLV gastroenteritis have been related to food and water contaminated by ill or post-recovery food handlers.

Contaminated drinking water and ice was suspected as the source of the recent gastroenteritis outbreak among young golfers in Phoenix. Raw shellfish harvested from waters contaminated with NLV have been a source of gastroenteritis outbreaks. NLV infection may also be transmitted through person-to-person contact, fomites, and possibly even the aerosol route if the virus becomes aerosolized through vigorous vomiting. Secondary attack rates among contacts are high.

Physicians can play an important role in public health by suspecting NLV when the clinical presentation is compatible. If a food or waterborne outbreak is suspected, please contact your local health department. Epidemiologic investigation is the best way to identify a source so that effective outbreak control measures can be taken and future cases prevented. The best prevention measures are hand-washing and strict hygiene in food and water handling.

Laboratory Testing for NLV

Public health scientists at the State Laboratory are developing a reverse transcription-polymerase chain reaction (RT-PCR) testing procedure for the detection of NLV that is based on protocols provided by the CDC. However, because NLV is actually a group of genetically and antigenically diverse viruses, cross-reaction with other viruses may occur during RT-PCR testing and, consequently, all positive results must be confirmed by DNA sequencing.

Samples that test positive by RT-PCR will be forwarded to the CDC for confirmation by a combination of electron microscopy, liquid hybridization followed by DNA sequencing and phylogenetic

Continued on page 4

Changes In Vital Statistics Data Collection

Beginning with the 2000 data year in Arizona (1999 nationally) two major changes have occurred that affect the computation of mortality rates, tabulation of leading causes of death and analyses of mortality data over time.

First, a new revision of the International Classification of Diseases (ICD), used to classify causes of death, was implemented. The Tenth Revision (ICD-10) has replaced the Ninth Revision (ICD-9), which was in effect since 1979. Second, a new population standard for the age adjustment of mortality rates has replaced the standard based on the 1940 population and used since 1943.

Both changes have profound effects on the comparability of mortality data and continuity in statistical trends. Age-adjusted rates can only be compared to other age-adjusted rates that use the same population standard. Changing the standard has affected the magnitude of age-adjusted death rates. For example, in 2001, the Arizona age-adjusted death rate for cardiovascular disease based on the 1940 standard was

The age-adjusted death rate based on the year 2000 standard was 73 percent greater than that based on the 1940 standard.

154.6 deaths per 100,000 population. The age-adjusted death rate based on the year 2000 standard was 267.3/100,000, 73 percent greater than that based on the 1940 standard. The age-adjusted rates based on the year 2000 population standard are larger because the new standard reflects an older age structure and it gives more weight than the 1940 standard to death rates at older ages where mortality is higher.

Breaks in comparability of mortality statistics effective with deaths occurring in 2000 and later also result from the implementation of ICD-10. ICD-10 is far more detailed than ICD-9, with about 8,000 categories compared with about 5,000 categories.

Any comparison of causes of mortality in Arizona between 2000 and previous years needs to take into account the changes in statistical trends that can be attributed to changes in the classification system alone. In order to assess whether changes in causes of death are "real" or due to new coding and classification procedures, "comparability-modified" mortality rates are used for some of the leading causes of death.

For more information on ICD-10 code revisions, contact Christopher Mrela at 602.542.2955 or cmrela@hs.state.az.us.

See Tables on Page 5

Norwalk Like Viruses – Continued from page 3

analyses to detect and characterize NLV strain types. It is anticipated that RT-PCR testing for NLV by the State Laboratory will be implemented by the end of the year. Confirmation of NLV positive samples by sequence detection and genetic analyses will be offered at the State Laboratory at a later date.

Submission of samples to the Arizona State Laboratory for NLV testing should be discussed with State infectious diseases epidemiologists at 602.230.5932 before they are sent to the lab. Laboratory samples, including stool and vomitus, should be collected in clean sterile containers and shipped immediately at 4°C (on cool packs). Approximately 5.0–10.0 gm or 5.0–10.0 mL (if liquid) of sample are required to perform the laboratory test. NLV may be identified in stool specimens by RT-PCR for up to 2 weeks after illness. In outbreak settings, your local health department may request stool specimens for PCR testing as part of an epidemiologic investigation. Turn around time for the RT-PCR screen is expected to take 72 hours. Reports will be mailed to submitting agencies. Positive results will be phoned in to the submitting agencies and the Bureau of Epidemiology and Disease Control for outbreak investigation.

Questions regarding submission of specimens for testing may be called in to the Virology Section of the Arizona State Laboratory at 602.542.6134.

Ref: "Norwalk Virus and Other Caliciviruses," Mandell, Douglas,and Bennett's Principles and Practice of Infectious Diseases, 5th ed., 2000, Churchill Livingston.

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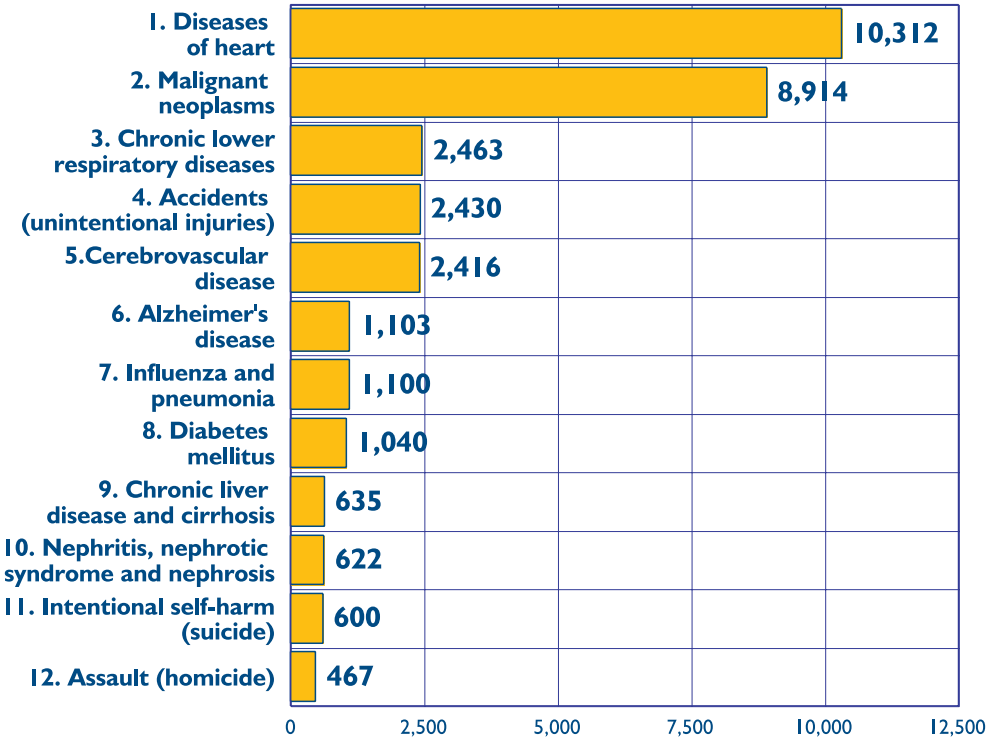
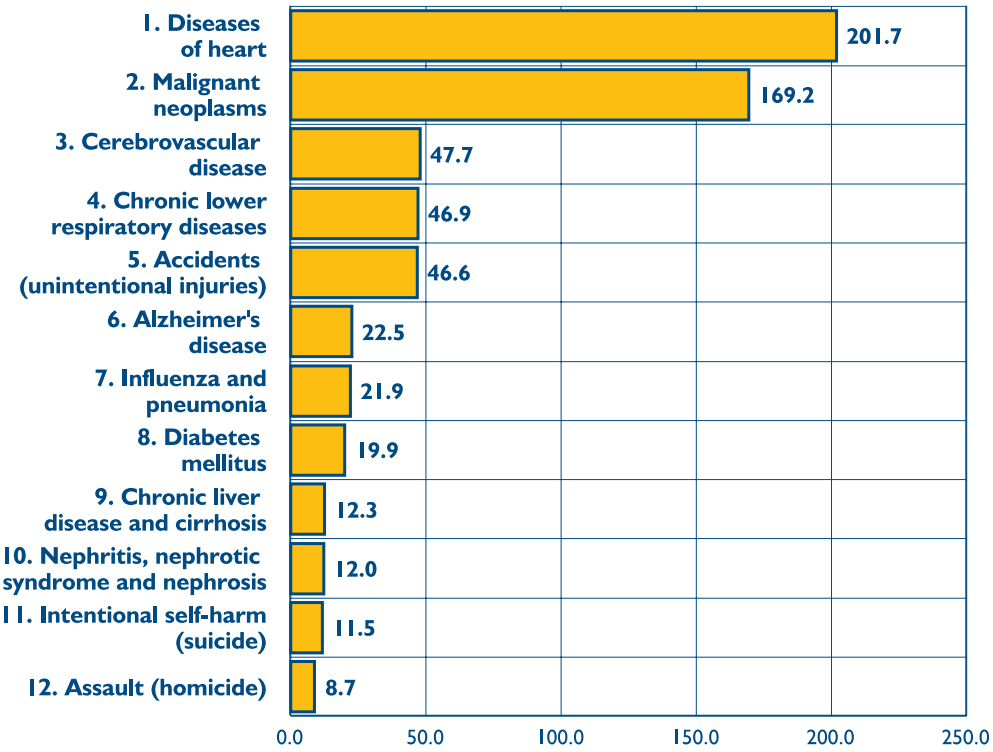
Norwalk-Like Viruses (NLV) cause approximately 23 million cases of gastroenteritis each year

Twelve Leading Causes of Death Among Arizona Residents in 2001

BASED ON THE NUMBER OF DEATHS:



BASED ON AGE-ADJUSTED* MORTALITY RATES:



* Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

Note: the cause-of-death titles are according to the Tenth Revision of the International Classification of Diseases (ICD-10).

Based on Number of Deaths

The leading cause of death to Arizona residents in 2001 continued to be heart disease, which accounted for 10,312 or 25.2 percent of all. Cancer remained the second most frequent cause of death to residents of the state, being responsible for 21.8 percent of all deaths in 2001. Deaths due to chronic lower respiratory diseases (a title change from ICD-9 title chronic obstructive pulmonary disease) ranked third in 2001, with 2,463 resident deaths reported. In 2001, chronic lower respiratory diseases accounted for 6 percent of all deaths. The fourth leading cause of death, accidents (unintentional injuries), accounted for 2,430 or 5.9 percent of total deaths. Deaths due to cerebrovascular disease ranked fifth in 2001, with 2,416 resident deaths reported. Together, these five causes accounted for 65 percent of total deaths in 2001.

Based on Age-Adjusted Mortality Rates

Because the age pattern of mortality varies greatly by cause of death, changes in crude death rates over time can be influenced by the changing composition of the population. In contrast, age-adjusted death rates eliminate the influence of such shifts in the population age structure. Therefore, age-adjusted death rates are better indicators than crude rates for showing changes in mortality risk over time and among causes of death. Beginning with the 2000 report, all age-adjusted mortality rates use the estimated year 2000 population as a standard. In order to provide continuity and ease of interpretation, all age-adjusted mortality rates for years before 2000 have been re-calculated using the year 2000 standard population.

The age-adjusted mortality rates for five of the 12 leading causes of death showed an increase from 2000 to 2001: accidents, Alzheimer's disease, diabetes, nephritis, and assault (homicide).

Neonatal Meningitis Prevention Guidelines Revised

By Clare M. Kioski, M.P.H.

Group B Streptococcus (GBS) remains the leading cause of serious neonatal infection despite great progress in perinatal GBS disease prevention in the 1990s. Approximately 10% to 30% of pregnant women are colonized with GBS in the vagina or rectum. In Arizona, invasive Group B Streptococcus has been reportable since April 1997. There were 55 cases (0.7 per 1000 live births) reported in 2001 (Table 1) of which 21% were Hispanic.

Data collected after publication of the 1996 guidelines for the prevention of perinatal Group B streptococcal disease prompted reevaluation of prevention strategies. Some of the key changes in the 2002 guidelines are:

- Recommendations of universal prenatal screening for vaginal and rectal colonization of ALL pregnant women at 35-37 week's gestation;
- Detailed instruction on prenatal specimen collection (vaginal-rectal swabs) and expanded methods of GBS culture processing;
- Updated prophylaxis regimens for women with penicillin allergy;
- Recommendations against routine intrapartum antibiotic prophylaxis for GBS colonized women undergoing planned cesarean deliveries who have not begun labor or had rupture of membranes;
- A suggested algorithm for management of patients with threatened preterm delivery; and
- An updated algorithm for management of newborns exposed to intrapartum antibiotic prophylaxis.

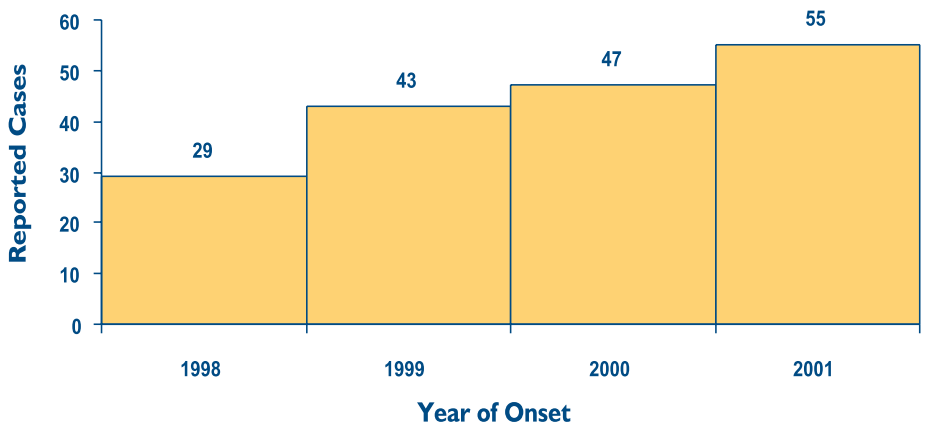
The 2002 guidelines and tools to help promote prevention and educate providers and parents of infants with early-onset GBS disease are available at www.cdc.gov/groupbstrep.

Adapted from: Centers for Disease Control and Prevention, Prevention of Perinatal Group B Streptococcal Disease. MMWR 2002;51(No. RR-11): 1-22.

Clare Kioski is an epidemiologist with the Office of Infectious Disease Services and can be reached at 602.230.5932 or ckioski@hs.state.az.us.

Figure 1

Reported Cases of Group B *Streptococcus* Invasive Disease among Infants in Arizona by Year of Onset



Valley Fever

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tal and demographic factors associated with the increase, evaluate the surveillance system for coccidioidomycosis, and attempt to identify measures that may help in preventing further disease. Findings and conclusions from this investigation will be shared in a later issue.

Diagnosis of primary coccidioidomycosis will aid in diagnosis of future cocci-related complications, rule out other causes and ease the patient's anxiety with a diagnosis.

Clinical consultation for coccidioidomycosis is available through the Valley Fever Center for Excellence (http://www.arl.arizona.edu.vfce) at 1-520-629-4700. Coccidioidomycosis is reportable under A.A.C. R9-6-301.

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SUMMARY OF SELECTED REPORTABLE DISEASES

(January - September, 2002)[1]

	Jan - Sept 2002	Jan - Sept 2001	5 Year Median Jan - Sept
VACCINE PREVENTABLE DISEASES:			
Haemophilus influenzae, serotype b invasive disease (<5 years of age)	3 (1)	8 (4)	6 (3)
Measles	0	1	1
Mumps	1	2	4
Pertussis (<12 years of age)	45 (30)	328 (135)	59 (36)
Rubella (Congenital Rubella Syndrome)	0 (0)	0 (0)	1 (0)
FOODBORNE DISEASES:			
Campylobacteriosis	531	495	420
E.coli O157:H7	33	25	30
Listeriosis	12	6	9
Salmonellosis	479	507	569
Shigellosis	300	320	387
VIRAL HEPATITIDES:			
Hepatitis A	254	319	554
Hepatitis B	188	123	148
Hepatitis B: non-acute[2]	758	1104	*
Hepatitis C	3	9	17
Hepatitis C: non-acute[2]	3424	2665	*
INVASIVE DISEASES:			
Streptococcus pneumoniae	576	627	510
Streptococcus Group A	217	135	142
Streptococcus Group B in infants <30 days of age	19	42	25
Meningococcal Infection	23	16	37
SEXUALLY TRANSMITTED DISEASES:			
Chlamydia	11218	10868	9391
Gonorrhea	2759	2968	3036
P/S Syphilis (Congenital Syphilis)	148 (11)	117 (21)	148 (20)
DRUG-RESISTANT BACTERIA:			
TB isolates resistant to at least INH (resistant to at least INH & Rifampin)	8 (0)	8 (1)	8 (1)
Vancomycin resistant *Enterococci* isolates	674	522	593
VECTOR-BORNE & ZOONOTIC DISEASES:			
Hantavirus Pulmonary Syndrome	1	1	3
Plague	0	0	1
Animals with Rabies	117	114	61
ALSO OF INTEREST IN ARIZONA:			
Coccidioidomycosis	2314	1243	1243
Tuberculosis	157	158	158
HIV	381	418	336
AIDS	412	404	404
Lead Poisoning (<16 years of age)	223 (200)	178 (154)	321 (184)
Pesticide Poisoning[3]	1	13	13

1 Data are provisional and reflect case reports during this period except Lead Poisoning which is by date of diagnosis.
2 These counts reflect the year reported or tested and not the date infected.
** Case counts for non-acute Hepatitis B and C are not available before 1998.*
3 Not all reports will be confirmed as meeting the case definition for pesticide poisoning upon further investigation.

Prevention bulletin

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West Nile Virus – Continued from page 1

Maricopa and Pima counties), and 15 to WEE (Yuma and Maricopa counties). Additionally, one horse with neurologic illness tested positive for WEE in Cochise County. County vector control personnel stepped-up mosquito control efforts in the affected areas.

The WNV morbidity and mortality nationwide in 2002 resulted in dramatic increases in requests for laboratory testing for WNV across the country. Virtually all state health laboratories and the Centers for Disease Control and Prevention (CDC) were swamped with specimens. As a result, many states, including the ASHL, have established submission criteria for WNV testing (see below).

The ASHL performs an IgM Capture ELISA (enzyme linked immunosorbent assay) for WNV, and Complement Fixation (CF) for other arboviruses, including SLE, WEE, EEE (eastern equine encephalitis) and VEE (Venezuelan equine encephalitis). Serologic testing can be performed on serum or CSF. Blood can be collected in a red top tube or serum separator. Please consult with your local health department epidemiology staff prior to submitting specimens for testing to:

Arizona State Health Laboratory
Attn: Serology/Arbovirus Testing
1520 West Adams
Phoenix, Arizona 85007

The ASHL is providing arbovirus testing (including WNV) for all cases of encephalitis, and hospitalized cases of aseptic meningitis (especially in adults) that occur from May through November.

Please Note: most arbovirus related illnesses tend to occur during the summer and fall as this corresponds with peak arbovirus activity in mosquito populations. The following information must be submitted with all specimens: patient name, date of birth, onset date, specimen collection date, symptoms/diagnosis, and any significant travel history prior to onset. Lack of pertinent information may delay testing. Priority will be given to hospitalized cases. A number of commercial laboratories also offer WNV testing. Please promptly report WNV positive results to your local health officials.

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