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West Virginia EPI-LOG

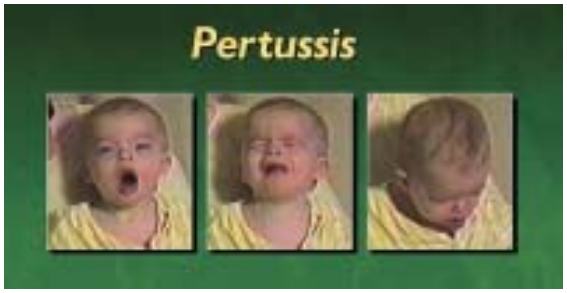
Statewide Disease Facts & Comparisons

A quarterly publication of the West Virginia Division of Surveillance and Disease Control

From *Morbidity and Mortality Weekly Report*:

Fatal case of infant pertussis in West Virginia, 2004

In December 2004, an infant aged 29 days in West Virginia died from pertussis after exposure to adult family members with probable undiagnosed pertussis. Pertussis (i.e., whooping cough) is a prolonged respiratory illness caused by the bacterium Bordetella pertussis and characterized by a violent cough, inspiratory whoop, and posttussive vomiting. The cough often lasts from several weeks to up to 3 months. However, adolescents and adults, even those previously vaccinated as children, often have disease not recognized as pertussis, leading to intrafamilial and nosocomial transmission (1). In the United States, children aged <6 months are at the highest risk for severe illness or death from pertussis because most infants do not complete their primary vaccination series until age 6 months (1). This report summarizes results of the West Virginia Department of Health and Human Resources (WVDHHR) case investigation, which underscore the critical need to prevent pertussis transmission to infants from adolescents and adults with undiagnosed disease.



On December 11, the infant was taken by her parents to a local emergency department (ED) with difficulty breathing. The infant had been coughing for approximately 5 days with increasing severity, resulting in posttussive

*(See **Pertussis**, page 5)*

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WEST VIRGINIA Department of Health & Human Resources
West Virginia Bureau for Public Health

Joe Manchin III, Governor
Martha Walker, Secretary (DHHR)

The Youth Peer Education Project

Training young people to be role models and opinion leaders in HIV/AIDS & STD prevention

What is Peer Education?

The HIV/AIDS and STD Program's Peer Education Project is an informal educational method used as a preventive strategy to limit the spread of HIV/AIDS and Sexually Transmitted Diseases. It is a method, which enables one peer to educate his or her fellow peers, providing important prevention messages and education. It enables peers to build and develop skills for public speaking, teamwork, leadership and the ability to make positive changes in behaviors and attitudes.

What are the advantages of Peer Education?

The program is designed to heighten awareness and deepen understanding about HIV/AIDS and STD's. It allows students to build self-esteem, cope with peer pressure and enable healthy relationships and overall good healthy decision-making. Peer educators are role models who are actively involved in the betterment of the community, their classmates, and themselves. Peer Education provides opportunities for student leadership and creativity.

Why should "peers" be targeted?

The word "peer" is commonly used to describe someone who is faced with similar situations or someone who is a part of the same group (e.g., a social group). We know that peers listen more to each other; therefore, it is logical to educate them in order to make sure the information they share is accurate and effective.

What is the goal of the program?

The program's goal is to train a select group of students within a school on HIV/AIDS and STDs with the responsibility of educating their peers. These students assume responsibilities of group leaders, role models, and facilitators in school and community-based workshops. The main overall goal is to prevent disease and reduce risky sexual behavior of young adults.

When did this project start?

A conference to reinstate peer education to West Virginia schools was held in December of 2004 in Morgantown by the HIV/AIDS and STD Program. Twelve schools from the northern part of the state attended this conference. A similar conference was held in January of 2005 at the Tamarack in Beckley. Nine schools from the southern part of the state attended this conference.

Who offers the Peer Education Training?

The Bureau for Public Health's HIV/AIDS and STD program offers training for high school students in West Virginia. The program involves working with schools across the state with special emphasis placed on targeting counties with a high prevalence of HIV/AIDS and STDs. The peer education program is created for the students and managed by the students.

What training is involved?

Extensive training is given to peer educators including HIV/AIDS and STD training, skill building, public speaking skills and training in teaching back to their peers. Games

*(See **Peer Education**, page 9)*

Randolph County, WV, July 2004:
Two cases of Hantavirus Pulmonary Syndrome

Hantavirus pulmonary syndrome (HPS) is a rare cardiopulmonary disease caused by viruses of the genus Hantavirus, for which rodents are the natural reservoir (1,2). Transmission to humans occurs by direct contact with rodents or their excreta or by inhalation of aerosolized infectious material (e.g., dust created by disturbing rodent nests). In July 2004, HPS cases (including one fatal case) were reported in two persons believed to have been exposed at sites approximately 12 miles apart in Randolph County, West Virginia (2000 population: 28,254) (3). This report describes the two cases and summarizes their epidemiologic and environmental investigations. Clinicians and the public need to be educated about the risk for HPS and methods to reduce that risk.

BOX. Epidemiology, diagnosis, treatment, and prevention of hantavirus pulmonary syndrome (HPS)

Epidemiology
- Zoonotic disease caused by viruses in the genus *Hantavirus*
- Transmitted to humans by exposure to excreta of infected rodents
- Incubation period: 1–5 weeks
- Cases reported throughout the United States
- U.S. case-fatality rate: 37%

Clinical and laboratory findings
- Prodrome of fever, myalgias, cough, and nausea/vomiting
- Rapid progression after the prodrome to pulmonary edema and nonischemic, cardiogenic shock
- Acute respiratory distress syndrome on chest raiograph
- Thrombocytopenia and hemoconcentration
- Confirmation by serology; additional confirmation by immunohistochemistry or reverse transciptase-polymerase chain reaction

Treatment
- Intensive supportive care, including early intubation and mechanical ventilation; intravenous pressors
- Early placement of pulmonary artery catheter
- Judicious volume resuscitation
- No specific antiviral treatment available

Prevention
- Find and seal rodent entry-holes in building
- Trap rodents in and around building using snap traps
- Before handling dead rodents, rodent feces, nests, or contaminated surfaces, spray thoroughly with a household disinfectant or diluted household bleach (one part bleach added to nine parts tap water)
- Wear disposable gloves when handling rodents or their excreta and wash hands immediately afterwards
- Report suspected cases to state health department
- Additional information is available at http://www.cdc.gov/hantavirus or refer to http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5109a1.htm.

Case Investigations

Patient A.

In early July, a wildlife sciences graduate student, a man aged 32 years, visited an emergency department (ED) in Blacksburg, Virginia, with complaints of fever, cough, and sore chest since the previous evening. The ED clinician noted possible rodent exposure in the medical history of the patient. Examination revealed a temperature of 102.7°F (39.3°C) and an oxygen saturation of 96% (normal). A complete blood count (CBC) revealed a left shift with no bands (granulocytes: 87%) and lymphopenia (lymphocytes: 400/mm3). Radiographic examination indicated faint right-sided pneumonia. In the ED, the graduate student began vomiting and was admitted for intravenous hydration and parenteral antibiotics. He became progressively hypoxic, requiring supplemental oxygen, bilevel positive airway pressure, and eventually intubation with mechanical ventilation. Repeated radiographs revealed bilateral pulmonary edema.

The next day, the patient was hypotensive, requiring intravenous pressor support. He received activated protein C to prevent disseminated intravascular coagulation (DIC). A repeat CBC revealed bands (granulocytes: 20%) and a decreased platelet count (115,000/mm3); urinalysis indicated mild hematuria and proteinuria. Despite aggressive supportive care, the patient's status continued to deteriorate, and he died on the third day of his hospitalization. Differential diagnosis included tularemia, pneumococcal sepsis, and HPS. Serum specimens submitted to ARUP Laboratories (Salt Lake City, Utah) were positive for both IgG and IgM antibodies to hantaviruses; these test results were confirmed by CDC. A spleen biopsy was also positive by immunohistochemistry for hantavirus antigens. A serum sample was positive for hantavirus RNA by real-time reverse transcriptase-polymerase chain reaction (RT-PCR). Sequencing of the amplified nucleic acid identified the virus as Monongahela hantavirus (4).

According to interviews with his coworkers, the patient had spent the previous month trapping small mammals for study and handling mice (Peromyscus spp.) daily. Two students and a recent graduate who had worked with the patient reported that none of them had consistently worn gloves while handling rodents or washed their hands after handling rodents or their excreta, even before eating. The students also reported frequent rodent bites on their bare hands.

Patient B.

In early July, a Randolph County resident, a man aged 41 years, spent a weekend at a log cabin with his family. Two days later, he had fatigue, a dull headache, and a mild fever. The following day, he had a temperature of

*(See **Hantavirus**, page 4)*

*(**Hantavirus**, continued from page 3)*

102.9°F (39.4°C). The next morning, he visited his primary-care physician with hematuria but no fever and was released on empiric antibiotic therapy for a possible urinary tract infection.

The patient returned 2 days later with a severe headache of approximately 12 hours' duration; he was referred immediately to the local ED. On arrival, the patient was hypoxic with a room air oxygen saturation of 90%; chest radiographs revealed right-sided pneumonia and congestive heart failure. The patient was airlifted to a referral hospital, with hypotension and bradycardia. His white blood cell count was normal, and cardiac enzymes were negative. The patient was placed in the intensive care unit and administered intravenous pressors and broad-spectrum antibiotics. Differential diagnosis included viral myocarditis, atypical pneumonia, and opportunistic infection, and was later broadened to include HPS and other infectious and autoimmune etiologies.

The patient was intubated the next day and started on high-frequency oscillator ventilatory support. The patient's condition deteriorated, with onset of thrombocytopenia, DIC, hypoalbuminemia, and renal insufficiency requiring hemodialysis. After 5 days of hospitalization, his condition began to improve. Serum samples were reported positive for IgG and IgM antibodies to hantaviruses by ARUP Laboratories; these results were confirmed by CDC. In addition, a serum sample taken during his hospitalization was positive for hantavirus RNA by RT-PCR. Sequencing of the amplified nucleic acid also identified the virus as Monongahela hantavirus. The patient recovered slowly during the next month.

According to family members, when the patient and his family arrived at the cabin in early July, they aired the interior after finding it reeking of rodent urine and discovered two live mice in a trash can in the kitchen. The patient killed the mice and later disposed of the remains and cleaned the trash can without wearing gloves. The family slept in the cabin that weekend and trapped six additional mice during their stay.

Environmental Investigation

On August 3, investigators from CDC and the West Virginia Department of Health and Human Resources discovered additional live mice in the trash can in the cabin of patient B. Openings in the walls and eaves were identified that permitted easy entry by rodents. In all, rodents were trapped by the investigating team during August 3--6 from three rural sites in Randolph County: 1) the dormitory in which patient A lived and its surroundings, 2) a forest trapping site where patient A worked the week before his illness, and 3) the family cabin and surroundings of patient B. Fourteen white-footed mice (P. leucopus) and one deer mouse (P. maniculatus) were captured from 239 traps during a 3-day period. Tissue and blood specimens were collected and processed for serology. RT-PCR was conducted on specimens of rodents with positive serology results. Hantavirus antibodies were detected in one white-footed mouse, which was also positive for virus RNA by RT-PCR. Sequence of the amplified RNA indicated that the mouse was infected with Monongahela hantavirus identical to virus identified in rodents collected from the location where patient B was presumed to have been infected. The amplified nucleic acid sequence was similar, but not identical, to that amplified from patient A.

Editorial Note

Since HPS was first identified in the southwestern United States in 1993, a total of 379 laboratory-confirmed cases of HPS have been reported in the United States, including 32 retrospectively identified cases that occurred before 1993. Cases have been reported in 31 states, the majority of cases in the Southwest. Three cases of HPS have been identified as acquired in West Virginia. Subclinical infections are rare, according to antibody prevalence studies performed after the 1993 outbreak (5--7).

In the first case described in this report, exposure was probably occupational. Patient A regularly handled multiple mice, often suffered bites, and reportedly did not routinely wash his hands after handling rodents. In the second case, the exposure was peridomestic, likely associated with contact with live mice and their excreta while removing them from his cabin. Despite the temporal and geographic proximity of the two cases, no common exposure source, other than the rodent contact described, appears to exist.

These cases underscore the need to educate the public and clinicians about the risk for HPS in areas outside the Southwest. In addition, persons who have occupational exposure to rodents and their excreta should be trained in proper animal handling and use of personal protective equipment. Simple, effective methods are available to reduce exposure to hantaviruses (Box). Adherence to these precautions can reduce the incidence of HPS.

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*(**Pertussis**, continued from page 1)*

vomiting and several choking episodes. At presentation, the infant was lethargic, and examination revealed tachycardia and mild fever (99.5ºF [37.5ºC]). Before intubation and oxygen supplementation, the infant had thick, foamy mucus coming from her mouth, appeared cyanotic, and had an O2 saturation of 70% by pulse oximetry. Seizure activity was noted during intubation. Laboratory results revealed severe leukocytosis (white blood cell count: 104,100/µL; normal: 5,000--19,500/µL), severe lymphocytosis (26,600/µL; normal: 2,500--16,500/µL), and a nasopharyngeal swab was positive for respiratory syncytial virus (RSV) by rapid immunoassay alone. A chest radiograph revealed right upper lobe and perihilar infiltrates, and an electrocardiogram indicated supraventricular tachycardia. Three hours after arrival at the ED, the infant was transferred to a pediatric intensive care unit (PICU) with diagnoses of pneumonia and respiratory failure.

On transfer to the PICU, the infant was placed on droplet precautions and contact isolation, treated for suspected sepsis, and started on azithromycin for presumed B. pertussis infection on the basis of clinical signs. The infant's ventilator course was characterized by hypoxemia (admission PaO2/FiO2 ratio: 172) and increasing hypercarbia. Sequential cardiac ultrasounds demonstrated increasing pulmonary hypertension (right ventricular pressure: 2/3 systemic). Nineteen hours after admission, oxygenation worsened precipitously (PaO2/FiO2 ratio: 52--60) and failed to improve with nitric oxide administration or high-frequency ventilation. A double-volume exchange transfusion was performed (2), but the infant failed to improve and died approximately 30 hours after admission to the PICU.

A specimen obtained from the infant's nasopharynx after admission to the PICU was reported at the time of the infant's death to be positive for B. pertussis DNA and negative for B. parapertussis DNA by polymerase chain reaction (PCR); however, no specimen was submitted for culture. Results were negative by both rapid immunoassay and culture for RSV, influenza A and B, and parainfluenza viruses 1, 2, and 3, and negative by culture for adenovirus. The diagnosis of confirmed pertussis was based on history, clinical findings, and a positive PCR test (3). The infant might have had a coinfection with RSV based on the positive RSV rapid immunoassay at the ED; this result was not confirmed by a repeat RSV rapid immunoassay or by culture at the PICU.

The infant was born at 36 weeks' gestation (birth weight: 2,665 g) by normal, uncomplicated, vaginal delivery. The infant's mother, aged 20 years, had a prolonged paroxysmal cough with posttussive vomiting and whoop that began approximately 3 weeks before the infant's delivery. The cough was still present at the time of the infant's death. The mother received guaifenesin/dextromethorphan cough syrup after delivery. The infant's maternal grandmother, aged 58 years, had a prolonged paroxysmal cough illness (onset date: approximately 2 weeks before the infant's mother's illness) with posttussive vomiting; she had received azithromycin after a diagnosis of sinusitis. Two weeks before the infant's illness, the infant's father, aged 22 years, had onset of a paroxysmal cough illness of >3 weeks' duration.

A day after the infant's death, a case investigation identified four additional close contacts (two cousins, a paternal grandmother, and a great-grandmother) of the infant with cough illness (duration: 3--8 days) at the time of the infant's death. The birth hospital and the ED had no droplet precautions in place while the infant and the infant's symptomatic family members were in the facilities; 30 birth hospital and 11 ED employees were identified as potential contacts. The local health department and the ED provided erythromycin to 24 recent (i.e., during the preceding 3 weeks) contacts of the infant and symptomatic family members. Of nine nasopharyngeal swabs submitted for culture, all were negative for pertussis (all household members swabbed had been symptomatic for >3 weeks); no PCR testing for pertussis was performed. Pertussis alerts were issued to the public, health-care providers, schools, and a large retail store where the infant's father worked.

This case underscores the need to protect infants from pertussis transmission. The health-care community can limit the spread of pertussis by 1) educating caretakers and the public about preventing exposure of infants to any person with a cough illness, 2) educating health-care providers to consider pertussis in adolescents and adults with a cough illness and to ask these patients to wear a mask or isolate themselves from other patients, and 3) encouraging confirmation of pertussis by culture of nasopharyngeal secretions. Health-care providers must be encouraged to observe droplet precautions while attending to patients with respiratory illnesses. No U.S.-licensed pertussis vaccine for persons aged >7 years is available; however, in 2004, two pharmaceutical companies submitted biologics license applications to the Food and Drug Administration for two teta-

*(See **Pertussis**, page 9)*

Mid-Year 2005 West Virginia HIV/AIDS Surveillance Report

(see county-by-county maps on page7)

West Virginia AIDS and HIV Infection Cases by Age Group, Gender, Race and Risk Behavior Cumulative through June 30, 2005*

Characteristic	AIDS		HIV		Total	
Age Group~	**#**	**%**	**#**	**%**	**#**	**%**
Under 5	9	1	5	1	14	1
5-12	2	<1	0	0	2	<1
13-19	10	1	37	5	47	2
20-29	224	16	246	35	470	23
30-39	588	43	250	36	838	41
40-49	377	28	121	17	498	24
50 and Over	151	11	41	6	192	9
Total	**1361**	**100**	**700**	**100**	**2061**	**100**
Gender						
Male	1143	84	485	69	1628	79
Female	218	16	215	31	433	21
Total	**1361**	**100**	**700**	**100**	**2061**	**100**
Race						
White	1076	79	395	56	1471	71
Black	263	19	280	40	543	26
Other/Unknown	22	2	25	4	47	2
Total	**1361**	**100**	**700**	**100**	**2061**	**100**
Risk Behavior						
Adult						
MSM	741	55	290	42	1031	50
IDU	207	15	141	20	348	17
MSM/IDU	71	5	18	3	89	4
Coagulation Disorder	41	3	5	1	46	2
Heterosexual Contact with Known Risk	148	11	124	18	272	13
Heterosexual Contact with Unknown Risk	57	4	51	7	108	5
Transfusion/Transplant	35	3	6	1	41	2
No Identified Risk/Other**	50	4	61	9	111	5
Subtotal	**1350**	**100**	**696**	**100**	**2046**	**100**
Pediatric						
Coagulation Disorder	1	9	0	0	1	7
Mother HIV Positive	10	91	4	100	14	93
Subtotal	**11**	**100**	**4**	**100**	**15**	**100**
Total Adults & Pediatrics	**1361**	**100**	**700**	**100**	**2061**	**100**

MSM = **M**en having **S**ex With **M**en; **IDU** = **I**njecting **D**rug **U**ser

* AIDS data includes April 1984 through June 30, 2005;
HIV data includes January 1989 through June 30, 2005.

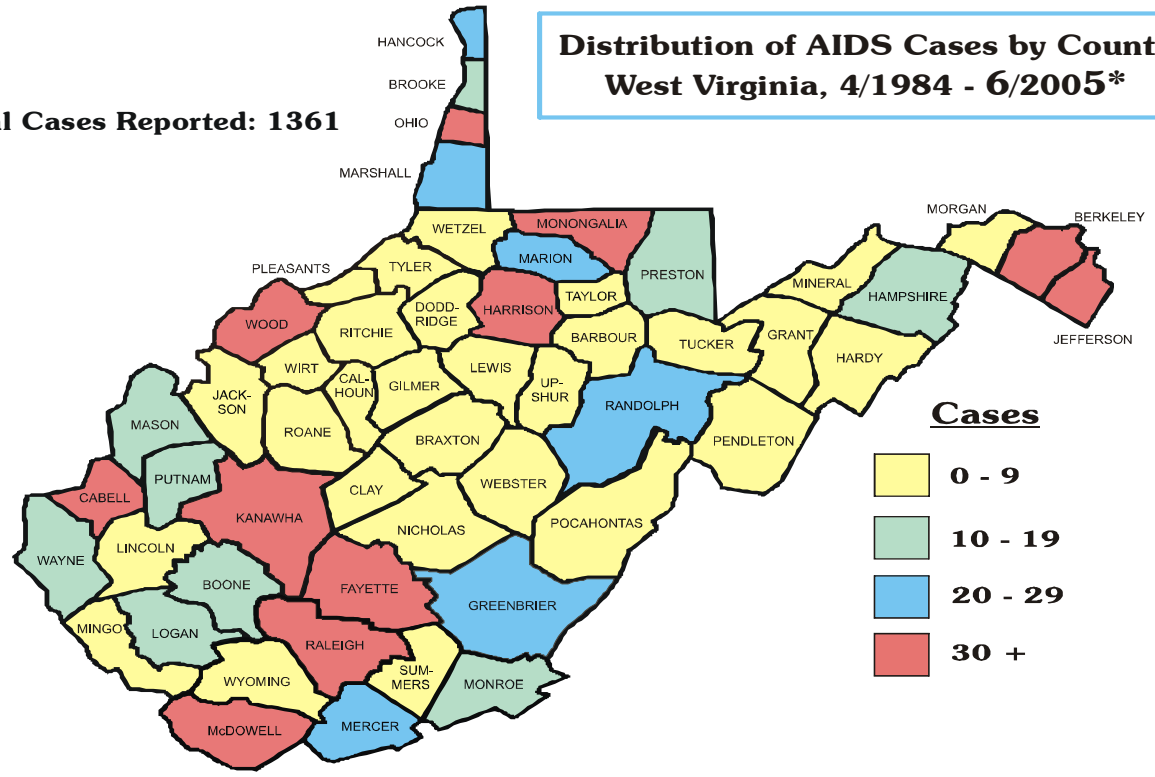
** Other risk behavior includes cases reported with no risk identified due to death or person moving away. These cases are closed due to inability to follow-up.

~ Age group intervals depicted in the table above may not be uniform due to:
a) Small number of cases in the under 13 age groups.
b) Cases twelve years of age and under are pediatric cases.
c) 13-19 being the adolescent age group.

Note: Percent in columns may not add up to 100% due to rounding.

Distribution of AIDS Cases by County West Virginia, 4/1984 - 6/2005*

Total Cases Reported: 1361



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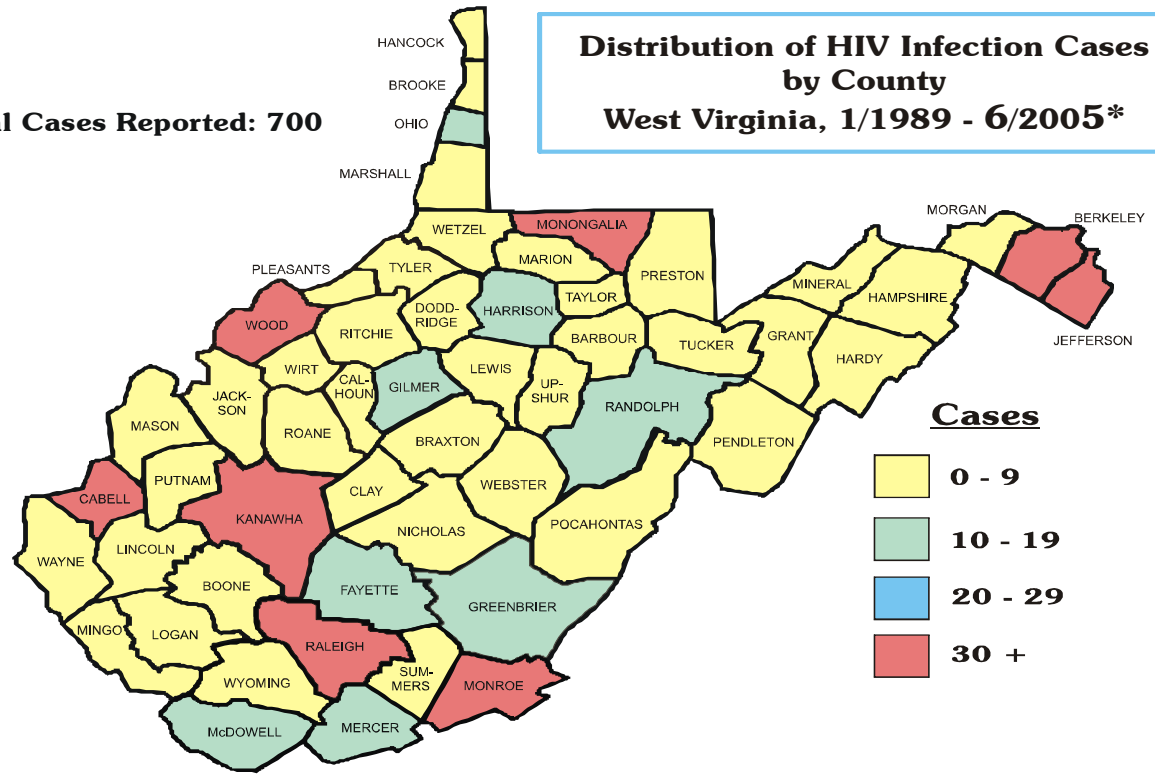
* AIDS data includes April 1984 through June 30, 2005.

Distribution of HIV Infection Cases by County West Virginia, 1/1989 - 6/2005*

Total Cases Reported: 700



Division of Surveillance and Disease Control
West Virginia HIV/AIDS/STD Program

*HIV data includes January 1989 through June 30, 2005.

West Virginia STD Program takes advertising awards

The HIV/AIDS/STD Program won two Gold and two Silver Addy Awards in the state's annual media competition sponsored by the Ad Council of Charleston. The two Gold award winners included the poster "Hot Burning Love"and the condom and wrapper "Let's Get It On." Both of these winners have been submitted for regional and national competitions. The two silver awards were for the "Reality Bites" poster and the "Hot Burning Love" newspaper ad.

The awareness campaign was suggested after an increase in gonorrhea and chlamydia cases in 2001. It was approved in 2003 and executed in 2004. A committee that included the senior public health advisor, health educators, Family Planning staff member and two Disease Investigation Specialists worked with the media group to develop the campaign. The campaign was presented to all staff within the agency and other educators for comment before final approval. Since the target audience was high school and college age individuals the campaign went out in September 2004, the beginning of their school year.

This media campaign had three parts: Bar outreach, posters and newspaper ads. All three parts were run from September through November 2004. The bar outreach was conducted in three different areas of the state: Charleston, Martinsburg and Beckley. Each event was advertised on local college campuses, and turnout for each event was impressive.

Three posters were developed. "Hot Blistering Love" was a poster disguised as a personal ad for someone seeking sex with the added possibility of sexually transmitted diseases (STDs). This poster was given to colleges around the state. The newspaper ad of this poster was also distributed to several college newspapers and *Graffiti,* the state's local entertainment magazine. "Reality Bites" consisted of two posters targeted at teens about acquiring an STD while looking for a good time. Both of the posters had newspapers ads which were placed in high schools throughout the state with the consent of the Department of Education.

The most controversial aspect of this campaign was a t-shirt which has had mixed reviews. It was targeted at colleges and has been very successful among that age group and the younger age group, but several complaints have been lodged that it promoted sex rather than STD awareness. The t-shirt has the "Top Ten Pick-Up Lines"on the back and the STD hotline number. The front of the shirt has only a logo statement which says "Let's get it on" on the front, left side of the shirt. However, the STD program staff felt any comments made about the shirt brought awareness and have been pleased with the quality of the entire campaign.

*(**Peer Education**, continued from page 2)*

and other non-traditional learning activities are used as techniques to reinforce information and put students at ease.

Which trainings are offered in 2005?

Since its inception, strong community and school acceptance of the Peer Education Program has resulted in many requests for training.

The following schedule was established this year for ninth grade students at Jefferson High School near Shepherdstown:

- April 8, 2005: Introduction to Peer Education including HIV/AIDS and STD training as well as skill building.
- May 2, 2005: Training on HIV/AIDS and STDs as well as role-plays and skill building.
- June 7, 2005: Train the trainer (Peer educators will train one another with assigned teach backs on HIV/AIDS and STDs).
- August 2005: Follow up training.
- Fall 2005: Continue follow up training until peer educators are certified.

The following schedule was developed for students from Oak Hill, Greenbrier West and Mt. Hope:

- April 15, 2005: Introduction to Peer Education including HIV/AIDS and STD training as well as skill building. (Follow-up is being planned).

And for students in Wheeling:

- August 15 and 16, 2005: Introduction to Peer Education Program.

How can I get involved?

If you want to schedule a peer education program or need more information about our program please contact Jodie Waldron with the Bureau for Public Health's HIV/AIDS and STD Program at (304) 558-2195 or 800-642-8244 or via email at jodiewaldron@wvdhhr.org.

*(**Pertussis**, continued from page 5)*

nus toxoid and reduced diphtheria toxoid and acellular pertussis vaccine adsorbed (Tdap) products, one for persons aged 10--18 years and the other for persons aged 11--64 years.

Acknowledgments

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