

# Public Health Update

October 2004

## Increase in Pertussis (Whooping Cough) *Record-breaking Increase in Reported Pertussis Cases in Colorado*

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As of October 1, 2004, a total of 172 pertussis cases have been reported in residents of Adams, Arapahoe, and Douglas Counties. This year-to-date (YTD) total for the first 9 months of 2004 is **2.5 times more** than the 5-year median of 70 cases for the same months during 1999-2003, and greater than the 12-month case total for any of the previous 5 years.

|               | 9-Month Total<br>January-September | 12-Month Total<br>January-December |
|---------------|------------------------------------|------------------------------------|
| 1999          | 42                                 | 59                                 |
| 2000          | 85                                 | 112                                |
| 2001          | 91                                 | 138                                |
| 2002          | 66                                 | 128                                |
| 2003          | 70                                 | 110                                |
| 5-year median | 70                                 | 112                                |
| <b>2004</b>   | <b>172</b>                         |                                    |

The pertussis increase in the Tri-County Health Department service area mirrors state-and nation-wide increases in pertussis cases; more than 530 cases have been reported to the Colorado Department of Public Health and Environment (CDPHE) this year to date. Colorado currently has the fifth highest incidence of pertussis in the United States (1). At the current rate, Colorado is headed for its highest number of pertussis cases since 1956. Several other states are also seeing large increases in the number of pertussis cases; overall, 63% more pertussis cases have been reported throughout the United States this year than were reported in 2003 (1). However, Colorado's children may be more vulnerable to this illness because Colorado has the lowest vaccination rate in the United States, with only 67.5% of children completing the primary series by three years of age, compared to the national average of 79.4% (2).

### **The role of health-care providers in preventing pertussis**

Health care providers can help alleviate the increase in pertussis with these important measures:

1. Test patients suspected of having pertussis in a timely manner with the rapid and sensitive PCR test for nasal wash specimens.
2. Provide antibiotic prescriptions for patients with pertussis and their close contacts, regardless of age or immunization history, to prevent further spread of this disease.
3. Instruct patients with pertussis to avoid public contact because they are contagious until they have completed 5 days of antibiotic treatment or 3 weeks of coughing if untreated.
4. Review vaccine coverage for pediatric patients and encourage parents to make sure that their children's immunizations are up-to-date.

**Please read further for more detailed information on these topics.**



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## Symptoms

Pertussis, caused by infection with *Bordetella pertussis* bacteria, begins with mild upper respiratory symptoms of a runny nose and sore throat for 3-14 days and then can progress to severe paroxysms of cough, inspiratory “whoop”, and post-tussive apnea and/or vomiting. Fever is absent or minimal, and uncomplicated cases will have no significant findings on thoracic radiographs. Complications can include secondary bacterial pneumonia, apneic episodes, ruptured optic vessels, otitis media, nutritional problems due to vomiting, fractured ribs, seizures and encephalopathy. Recordings of the inspiratory “whoop” can be heard on <http://www.whoopingcough.net>.

It is recommended that testing for pertussis be done if a patient has symptoms consistent with pertussis and/or there is reason to believe that they may have been exposed to someone with confirmed pertussis.

## Clinical case definition

A cough illness lasting at least 14 days with one of the following: paroxysms of coughing, inspiratory “whoop,” or post-tussive vomiting - and without other apparent cause.

## Transmission

Pertussis is transmitted by respiratory droplets and contact with respiratory secretions. Most transmission occurs during face-to-face contact with a known case while the case is infectious and coughing. In general, contact must be relatively close (within arm’s length) or consistent (4 or more hours together in an enclosed space). The typical incubation for pertussis is 7-10 days (range 5-21 days). The transmission rate of pertussis from a confirmed case to household contacts has been estimated to be as high as 81% (3).

## Infants are most vulnerable to severe illness

Pertussis may be very severe in infants and young children (especially those who have not had 3 doses of pertussis vaccine), resulting in hospitalization, pneumonia, seizures, long-term neurological problems, and rarely, death. Infected adults and older siblings are very likely to transmit pertussis to young children in their household.

## Pertussis can infect patients of all ages

This year, in the Tri-County area, more than 63 percent of pertussis cases have occurred in persons 10 years of age or older. Pertussis should be considered in the differential diagnosis of adult and adolescent patients with unexplained non-productive cough (4). Adult and adolescent patients with pertussis often have a longer duration of illness before their symptoms are recognized and treated. Thus, infected adults and adolescents with mild disease can be the reservoir for more severe infections in infants and young children.

In some individuals, immunity conferred by pertussis vaccines can wane in early adolescence. Currently, no pertussis booster vaccine is available for persons over the age of 6. However, two vaccine manufacturers have submitted applications for FDA licensing of booster vaccines for adolescents and/or adults. These vaccines may become available in the future.

## Laboratory testing

The polymerase chain reaction (PCR) is the preferred test for pertussis, because of high sensitivity, high specificity, and rapid result availability. Pertussis infection may be detected by PCR even if the patient has been treated or has been coughing for some time. A nasal wash (nasopharyngeal

aspirate) is the preferred specimen for pertussis PCR testing. Pertussis PCR testing is available at The Children's Hospital laboratory, CDPHE laboratory, and many commercial laboratories. The CDPHE laboratory provides pertussis PCR testing on a fee-for-service basis. Pertussis specimen collection instructions are available:

<http://www.cdphe.state.co.us/dc/epidemiology/pertussiscollection.pdf>

Other laboratory tests for pertussis are not as reliable as PCR and may not provide evidence of infection. The causative bacterium, *Bordetella pertussis*, is difficult to isolate through culture of respiratory secretions. Direct fluorescent antibody (DFA) testing for pertussis has low sensitivity and variable specificity. Serologic testing for pertussis is not standardized and cannot be used to confirm infection.

## Treatment and prophylaxis for patients and close contacts

Antibiotics should be prescribed for the patient **AND** all household and close contacts regardless of immunization status. The household and close contacts of a laboratory-confirmed pertussis case can receive prophylaxis without undergoing pertussis testing. Based on the very high (up to 81%) secondary transmission rate among members of the same household, Tri-County Health Department (TCHD) recommends timely prophylaxis of close contacts to prevent further spread of pertussis.

### Tri-County Health Department's recommended medications for treatment OR prophylaxis include:

**Azithromycin** (Zithromax; also available for children) 10 mg/kg (maximum=500 mg) on day 1, then 5 mg/kg (maximum=250mg) daily on days 2 through 5 for **5 days** total.

—or—

**Erythromycin base**\* 40-50 mg/kg per day, administered for 14 days in divided doses. For persons >80 lbs, it is given as 250 mg every 6 hours. This antibiotic is unavailable in liquid form for pediatric patients.

—or—

**Erythromycin estolate** (Ilosone) (not available for adults) 40 mg/kg per day, administered for 7 days in 2-3 divided doses.

—or—

**Trimethoprim-sulfamethoxazole**\* (Bactrim or Septra) 8 mg/kg/day of trimethoprim and 40 mg/kg/day of sulfamethoxazole every 12 hours for 14 days.

### Notes:

Please refer to the Physician's Desk Reference (PDR) or a pharmacist regarding contraindications to these antibiotics, especially for persons taking calcium channel blockers, antifungal agents, troleandomycin, and other CYP3A inhibitors.

\* These antibiotics are less expensive but have some side effects which can decrease patient compliance. Tri-County Health Department uses these antibiotics for patients who have no physician or no health insurance.

## Preventing transmission

Persons reported as suspect, probable, or confirmed cases of pertussis and persons identified as symptomatic (including slight cough) contacts of cases should be excluded from work, childcare, and/or school until they are no longer contagious. Persons are considered not contagious after completing 5 days of an appropriate antibiotic or until 21 days after cough onset if antibiotics are not taken.

## Vaccination

Complete vaccination (**5 DOSES**) with the acellular pertussis vaccine is strongly recommended for all children under six years of age. The vaccine for pertussis is only 71% to 89% effective in preventing infection (5), so some completely vaccinated children can still contract illness from household contacts. However, vaccination against pertussis has been shown to protect individuals with breakthrough infections from developing more severe disease. The primary series vaccination coverage of Colorado children under 3 years of age was only 67.5% in 2003, the lowest in the nation (the national average was 79.4%) (2). This low vaccination rate is allowing a larger number of breakthrough infections in populations that are expected to be protected. Children who missed doses due to the vaccine shortage in 2001 should be caught up with their final dose(s) as soon as possible.

## Reporting requirements to state or local health departments

Pertussis is a 7-day notifiable disease and must be reported to the Colorado Department of Public Health and Environment at 303-692-2700 (daytime hours) or 303-370-9395 (after hours and weekends) or to Tri-County Health Department at 303-220-9200 (daytime hours) or 303-461-2342 (after hours and weekends).

**For more information** please contact your state or local health department:

Tri-County Health Department  
(303) 220-9200 / 303-461-2342 (after hours and weekends)  
Fax: (303) 220-9208  
[www.tchd.org](http://www.tchd.org)

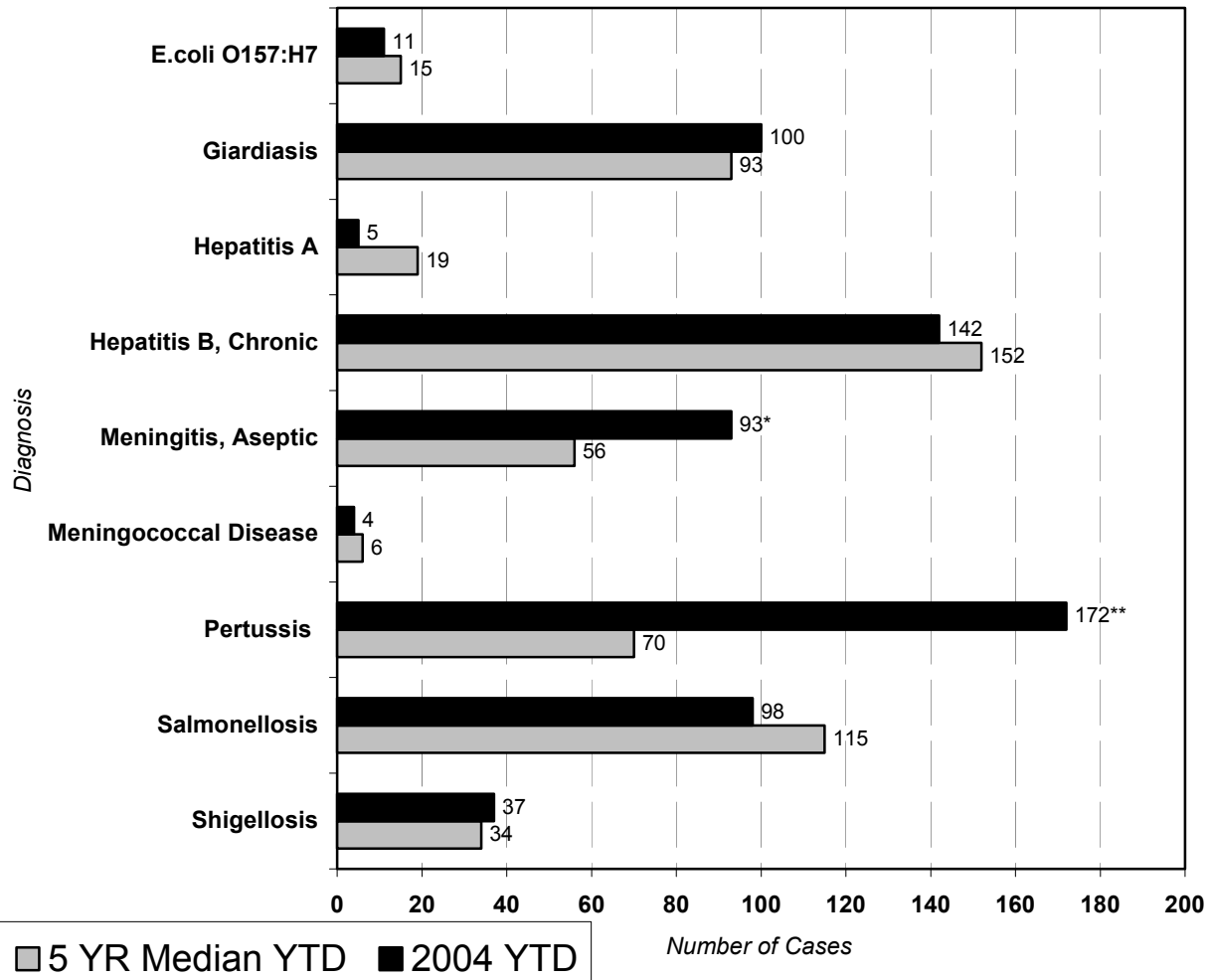
Colorado Department of Public Health and Environment  
(303) 692-2700 / (303) 370-9395 (after hours and weekends)  
Fax: (303) 782-0338  
[http://www.cdphe.state.co.us/dc/epidemiology/dc\\_guide.asp](http://www.cdphe.state.co.us/dc/epidemiology/dc_guide.asp) go to "Pertussis" in the "Vaccine Preventable Disease" section

Centers for Disease Control and Prevention  
<http://www.cdc.gov/health/pertussis.htm>

## References:

1. Pertussis surveillance report – 9/8/04. Bacterial Vaccine-Preventable Disease Branch, National Immunization Program, Centers for Disease Control and Prevention. 2004.
2. U.S. National Immunization Survey, 2003  
[http://www.cdc.gov/nip/coverage/nis/03/tab03\\_antigen\\_state.xls](http://www.cdc.gov/nip/coverage/nis/03/tab03_antigen_state.xls)
3. B. Trollfors, *et al.* Efficacy of monocomponent pertussis-toxoid vaccine after household exposure to pertussis. *Journal of Pediatrics*. 1997, 130:532-536.
4. N. H. Birkebaek *et al.* Bordetella pertussis and chronic cough in adults. *Clinical Infectious Diseases*. 1999, 29(5):1239-42
5. K. Edwards *et al.* Pertussis vaccine. In S.A. Plotkin & W. A. Orenstein, eds. *Vaccines*, Third Edition. Philadelphia, WB Saunders. 1999, Pp. 293-344.

### Selected Diseases by Date of Report Adams, Arapahoe, and Douglas Counties 2004 Year-to-date Through September



\*The increase in cases of aseptic meningitis has occurred mainly in the summer and fall months. It is likely a result of enteroviruses, however the serotype and etiology are unknown.

\*\*The increase in pertussis cases reported began in the month of March and continues through the present. Please read main document for further details.