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Division of Epidemiology & Health Planning
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Pneumococcal Disease Prevention

Pneumococcal disease, infections caused by *Streptococcus pneumoniae* bacteria, is among the leading causes of illness and death worldwide for young children, persons with underlying debilitating medical conditions, and the elderly. In the United States, pnuemococcal disease is responsible for up to 12,500 deaths annually, and accounts for more deaths than all other vaccine-preventable diseases combined. Most of these deaths occur in persons under two years or over 65 years of age.

The most commonly identified cause of bacterial pneumonia, *S. pneumoniae*, can also invade the bloodstream, causing bacteremia, and/or enter the tissue and fluid surrounding the brain and spinal cord, resulting in meningitis. Each year in the U.S., pneumococcal disease accounts for an estimated 500,000 cases of pneumonia, 60,000 cases of bacteremia, and 2,800 cases of meningitis. Pneumococci are a common cause of otitis media and are detected in 28% - 55% of middle ear aspirates. By age 12 months, 62% of children have had at least one episode of acute otitis media. Middle ear infections are the most frequent reasons for pediatric office visits in the U.S.—over 20 million visits each year. Complications of pneumococcal otitis media may include mastoiditis and meningitis.

Since 1987, the incidence of Drug-resistant Streptococcus pneumonia (DRSP) in the United States has increased. Each year, up to 40% of *S. pneumoniae* infections are caused by pneumococci resistant to at least one drug and 15% are due to a strain resistant to three or more drugs. The emergence of these resistant strains further emphasizes the need for preventing pneumococcal disease through vaccination.

Pneumococcal Vaccines

The first polysaccharide pneumococcal vaccine, containing purified polysaccharide antigen from 14 different types of pneumococcal bacteria, was licensed in the U.S. in 1977. In 1983, a 23-valent polysaccharide vaccine (PPV23) was licensed and replaced the earlier vaccine, which is no longer produced. PPV23 contains polysaccharide antigen from 23 types of pneumococcal bacteria which cause 88% of bacteremic pneumococcal disease. In addition, cross-reactivity occurs for several capsular types which account for an additional 8% of bacteremic disease. While the polysaccharide vaccine had been available in the nation for over 20 years, CDC found that in 1999 only 54% of those 65 and older reported having ever received the pneumococcal vaccine. This was an increase from 45.4% in 1997, but falls short of the 90% vaccination rate goal set by Healthy People 2010.

In 2000, the first pneumococcal conjugate vaccine (PCV7) was licensed in the U.S. It includes purified capsular polysaccharide of 7 serotypes of *S. pneumoniae* (4, 9V, 14, 19F, 23F, 18C, and 6B) conjugated to a nontoxic variant of diphtheria toxin known as CRM197. The serotypes included in PVC7 accounted for 86% of bacteremia, 83% of meningitis, and 65% of acute otitis media among U.S. children under 6 years of age in the years from 1978 and 1994. Other pneumococcal polysaccharide conjugate vaccines containing 9 and 11 serotypes of *S. pneumoniae* are under development.

Who Should Be Vaccinated?

Pneumococccal polysaccharide vaccine (PPV23) should be administered routinely to all adults 65 years of age and older and to persons ≥2 years of age with normal immune systems who have chronic illnesses,

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including cardiovascular disease, pulmonary disease, diabetes, alcoholism, cirrhosis, and cerebrospinal fluid leaks.

Others who should receive the vaccine are those aged ≥2 years who have a disease or condition that lowers the body's resistance to infection, such as Hodgkin's disease, lymphoma, leukemia, kidney failure, multiple myeloma, nephritic syndrome, HIV infection or AIDS, damaged or no spleen, and conditions such as organ transplantation.

The vaccine should be considered for persons living in special environments or social settings with an identified increased risk of pneumococcal disease, such as long term care facilities.

Target groups for pneumococcal polysaccharide vaccine and influenza vaccine overlap. The vaccines can be given at the same time at different sites without increased side effects.

A single dose of pneumococcal vaccine is recommended for most persons aged 65 years and older. Routine revaccination of immunocompetent persons previously vaccinated with 23-valent polysaccharide vaccine is not recommended. Persons aged 65 and older should be administered a second dose if they received the vaccine more than five years earlier and were less than 65 years old at the time of the first dose.

Vaccination should not be withheld in the absence of an immunization record or complete record. Persons with uncertain or unknown vaccination status should be given the vaccine.

Pneumococcal conjugate vaccine (PCV7) should be administered routinely to all children under 24 months of age and to those aged 24-59 months with high risk medical conditions. Priority should be given to children 24-35 months, children of Alaskan Native, American Indian, or African American descent, and children who attend group day care. PCV7 is not routinely recommended for persons ≥59 months of age.

The primary series of PCV7 vaccination begins in infancy and consists of three doses given at 2, 4, and 6 months, with a booster dose recommended at 12-15 months. PCV7 should be administered at the same time as other routine childhood immunizations, using a separate syringe and injection site. For children vaccinated at ≤12 months, the minimum interval between doses is 4 weeks. Doses given at ≥12 months of age should be separated by at least 8 weeks.

Children 7 months of age and older who have not been vaccinated do not require the full series of 4 doses. The number of doses needed to complete the series depends on the child's age. Unvaccinated children between 7-11 months should receive 2 doses, at least 4 weeks apart, followed by a booster dose at 12-15 months. Those unvaccinated aged 12-23 months should receive 2 doses, at least 8 weeks apart. Previously unvaccinated healthy children aged 24-59 months should receive a single dose of PCV7. Those in the 24-59 months age group with sickle cell disease, asplenia, HIV infection, chronic illness, or immunocompromising conditions should receive 2 doses of PVC7 separated by at least 8 weeks.

Major source of information for this article: *Epidemiology and Prevention of Vaccine-Preventable Diseases*, 7th Edition, January 2002. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

Other sources included:
"Facts About Pneumococcal Disease," October 2001.
"Facts About Pneumococcal Disease for Adults," August 2001.
National Foundation for Infectious Diseases
See http://www.nfid.org/factsheets/pneumofacts.html.
"Drug-resistant *Streptococcus pneumonia* Disease," July 1, 2002.
Centers for Disease Control and Prevention
See http://www.cdc.gov/ncidod/dbmd/diseaseinfo/drugresisstreppneum_t.htm.

Regulation Requires Pneumococcal and Influenza Vaccination in State's Long Term Care Facilities

An emergency administrative regulation (902 KAR 2:065E) was filed on July 11 to implement the provisions of HB 69, passed by the 2002 General Assembly to require the administration of influenza and pneumoccal vaccine to residents and staff of Kentucky's long term care facilities.

According to the "Statement of Emergency," the regulation was filed "on an emergency basis in order to implement the vaccine program in these facilities prior

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Regulation Requires Vaccination in Long Term Care Facilities

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to the start of the flu season that occurs in the fall. Failure to enact this administrative regulation on an emergency basis would pose an imminent threat to the public health, safety or welfare of those individuals working in, residing in, or to be admitted to a long term care facility because of the increased risk to their health due to influenza or pneumonia, both of which are preventable with this program." Language of the regulation follows.

902 KAR 2:065E

Necessity, Function, and Conformity: KAR 209.554 mandates the Cabinet for Health Services, Department for Public Health to promulgate administrative regulations to implement requirements of KRS 209.550 and KRS 209.552 relating to immunization of residents and staff of long term care facilities against influenza and pneumococcal disease. This administrative regulation establishes requirements for long term care facilities to document the immunization status of employees and residents for influenza and pneumococcal disease, to report outbreaks of influenza-like illness (ILI), and the educational material to be provided by the Department for Public Health to long term care facilities.

Section 1. Definitions.

(1) "Influenza" means an acute viral infection of the respiratory tract characterized by the sudden onset of a constellation of signs and symptoms such as fever, headache, myalgia, coryza, sore throat, and a dry cough caused by influenza viruses.

(2) "Influenza-like illness" (ILI) means, in the absence of a known cause (other than influenza), onset of fever greater than or equal to 100 degrees Fahrenheit, and cough, or sore throat.

(3) "Influenza vaccine" means a vaccine licensed by the Food and Drug Administration (FDA) which produces immunity to influenza.

(4) "Pneumococcal disease" means a bacterial infection usually involving the lungs producing inflammation caused by *streptococcus pneumoniae*, the bacteria commonly referred to as pneumococcus.

(5) "Pneumococcal vaccine" means the FDA licensed 23-valent pneumococcal polysaccharide vaccine (PPV).

(6) "Outbreak" means 2 or more cases of influenza, or ILI, occurring in a single long term care facility during a one week period.

Section 2. Immunization Schedule.

(1) Effective September 1, 2002, except as provided in KRS 209.552(5), each employee or resident of a long term care facility who is at high risk as defined by the Center for Disease Control's Advisory Committee on Immunization Practices (ACIP) and who has not been previously immunized against pneumococcal disease shall be immunized with pneumococcal vaccine by March 1, 2003.

(2) After March 1, 2003, except as provided in KRS 209.552(5), a new person hired or a new resident admitted to a long term care facility who meets the eligibility criteria recommendations of ACIP and has not been immunized against pneumococcal disease shall be immunized with pneumococcal vaccine within 3 months of the date of employment or admission.

(3) Except as provided in KRS 209.552(5), when vaccine is available, an employee or resident of a long term care facility who has not been immunized against influenza shall be immunized with influenza vaccine on an annual basis in accordance with the annual recommendations of the ACIP.

Section 3. Educational Literature.

Within 2 months of publication by the CDC, the Department for Public Health shall provide each licensed long term care facility in Kentucky with a camera-ready copy of the most current Vaccine Information Statements for influenza and pneumococcal disease.

Section 4. Reporting.

A long term care facility licensed in Kentucky shall submit a weekly written, telephonic, or electronic report of outbreaks of ILI occurring within the facility to the local county health department, or the Department for Public Health, Division of Epidemiology, Communicable Disease Branch, 275 East Main Street, Frankfort, Kentucky 40621, telephone (502)564-4478, facsimile (502)564-0542.

NOTE

A notice of intent to promulgate an "ordinary" administrative regulation (902 KAR 2:065) was filed on July 15. It should become effective in early 2003 and may contain revisions incorporated during the review and consideration process.

Recent Information on Pneumonia in Kentucky

Deaths Due to Pneumonia

In 1999, there were 576 total deaths due to pneumonia in Kentucky, making it the 10th leading cause of death in the state. (In the standard listing of leading causes, pneumonia is combined with influenza, and the combination of these was the 10th leading cause, but 95.4% of these deaths—576 out of 604—were due to pneumonia alone.) Adjusted to the U.S. 2000 standard population, the death rate due to pneumonia was 15.2 deaths per 100,000 persons.

Pneumonia was also the 10th leading cause of death for the 65+ population in 1999. There were 516 pneumonia deaths in this age group, accounting for 89.6% of total pneumonia deaths. The age-specific death rate for the 65+ population was 104.7 per 100,000.

Preliminary data for 2000 show a considerable increase over 1999 in pneumonia deaths. There were a total of 815 deaths due to pneumonia, making it the 8th leading cause in the total population. The age-adjusted rate increased to 21.1 per 100,000 persons.

Preliminary 2000 data indicate that the overall increase in deaths due to pneumonia were accounted for primarily by an increase among the 65+ population. There were 736 deaths due to pneumonia in Kentucky's population 65 and older, making it the 7th leading cause by moving ahead of unintentional injuries in the ranking. Of the total pneumonia deaths in 2000, 90.3%—736 out of 815—occurred among the 65+ population, and the age-specific rate was 145.8 per 100,000, an increase of 39.3% over 1999.

George Robertson, Manager
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Hospitalizations Due to Pneumonia

From January 1 through December 31, 2001, discharge records show there were 26,799 cases hospitalized for pneumonia (ICD-Codes 480-486) in Kentucky acute care hospitals. Of these, 56.2%, (15,076 cases) were in the 65+ age group. Persons ages 45-64 accounted for 20.7% (5,551) cases hospitalized due to pneumonia, while those ages 0-17 represented 13.7% (3,686) cases and those 18-44 comprised 9.3% (2,486) cases.

Discharge records show that a total of 149,084 hospitalization days were due to pneumonia, with persons 65 years and older accounting for 64.9% (96,796 days) of the total. Hospitalization days in the 45-64 years age group made up 20.4% (30,437 days). Persons 18-44 accounted for 7.5% of the total (11,161 days) and those in the youngest age group (0-17 years) represented 7.2% (10,690 days) of hospitalization due to pneumonia.

David E. Clark, Health Policy Specialist
Health Policy Development Branch

Immunization—Persons Age 65 and Older

Data collected and compared in the Kentucky Behavioral Risk Factor Surveillance System (BRFSS) for the years 1997 and 1999 show a dramatic increase—from 38.6% to 52.0%—in the prevalence of pneumonia immunization in Kentucky's 65+ population. (Pneumonia immunization questions were not asked in 1998 or 2000.) During each year, males age 65 and older reported a higher prevalence of having ever received a pneumonia vaccination than females. In 1999, 52.8% of whites in the 65+ age group said they had ever received the vaccine, compared to 36.4% of African Americans. (Figure 1.)

Prevalence of Pneumonia Immunization—Age 65+ By Gender & Race—Kentucky BRFSS

Year	1997	1999
Total Population	38.6%	52.0%
Gender		
Male	41.6%	54.9%
Female	36.6%	50.1%
Race		
White	39.1%	52.8%
African American	*	36.4%

Figure 1. * Sample size too small for reliable estimate.

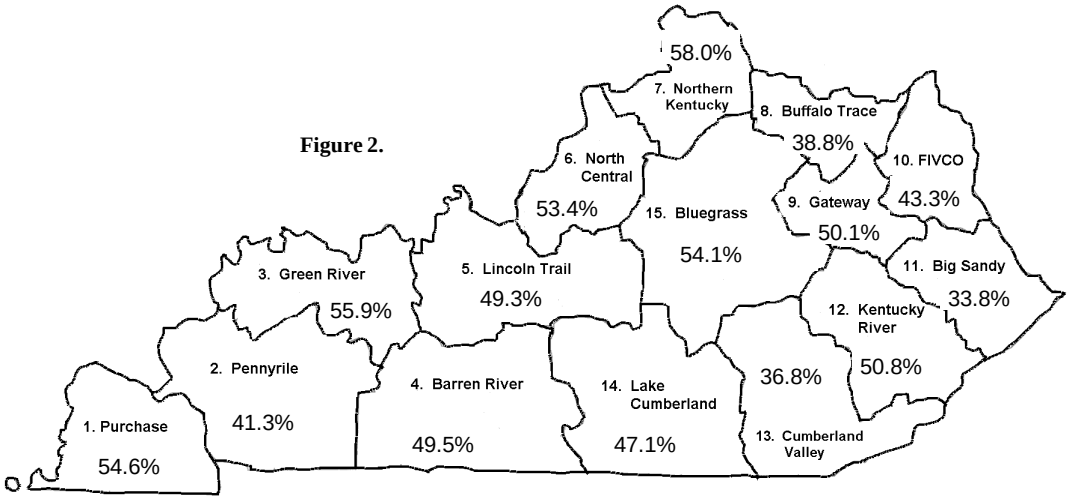
Kentucky's Area Development District (ADD) with the highest pneumonia vaccination prevalence among those 65 and over was Northern Kentucky at 58.0%. The Big Sandy ADD had the lowest prevalence at 33.8% (For prevalence of pneumonia immunization, Area Development District averages, 1997 and 1999, see Figure 2 on page 5.)

Sara Robeson, Health Policy Specialist II
Surveillance & Health Data Branch

Pneumonia Immunization in Kentucky (1997 and 1999)

Average Prevalence of Immunization—Persons Age 65 and Older By Area Developme nt Districts

Figure 2.



Kentucky Health Behavior Trends, 1997-1999 ✍ Kentucky Behavioral Risk Factor Surveillance System

Influenza Immunization Recommendations Revised

(The following article is reprinted from MMWR 2002;51:563 to clarify recommendations first published by MMWR in April.)

Erratum: Vol. 51, No. RR-3

The MMWR Recommendations and Reports, "Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices," published on April 12, 2002, contained an inconsistency in the recommended timing of vaccination of target groups. In the section, "Vaccination in October and November," persons at increased risk for influenza-related complications (e.g., persons aged ≥65 years and persons aged 6 months–64 years with high-risk medical conditions) and health care workers were recommended for vaccination in October. In addition, children aged 6 months to <9 years receiving influenza vaccine for the first time need a booster dose ≥1 month after the first dose and, thus, also were recommended to be vaccinated in October or earlier. However, in the section, "Timing of Organized Vaccination Campaigns," household contacts of persons at high risk were also included among those recommended to begin vaccination in October, but children aged <9 years receiving vaccine for the first time were not discussed.

To clarify, vaccination of the following groups should begin in October, regardless of the setting in which a person receives vaccination:

- Persons at increased risk for influenza-related complications (persons aged ≥65 years, persons aged 6 months–64 years with certain medical conditions, and healthy children aged 6–23 months);*
- Health care workers;
- Household contacts of persons at increased risk for influenza-related complications (including contacts of infants aged <6 months who are not eligible for influenza vaccine); and
- Children aged 6 months to <9 years receiving influenza vaccine for the first time.

The current projected distribution of U.S. influenza vaccine for 2002-2003, on the basis of aggregate manufacturer estimates, is 92-97 million doses, with the majority of doses expected to be distributed by the end of October. This projection is based on early estimates and might change as the season progresses. Thus, supplies are expected to be adequate for prioritization of persons at increased risk for influenza complications, their household contacts, and health care workers for vaccination in October.

**This group also might be offered vaccination in September, if available, when seen for routine care or during hospitalization to avoid missed opportunities for vaccination.*

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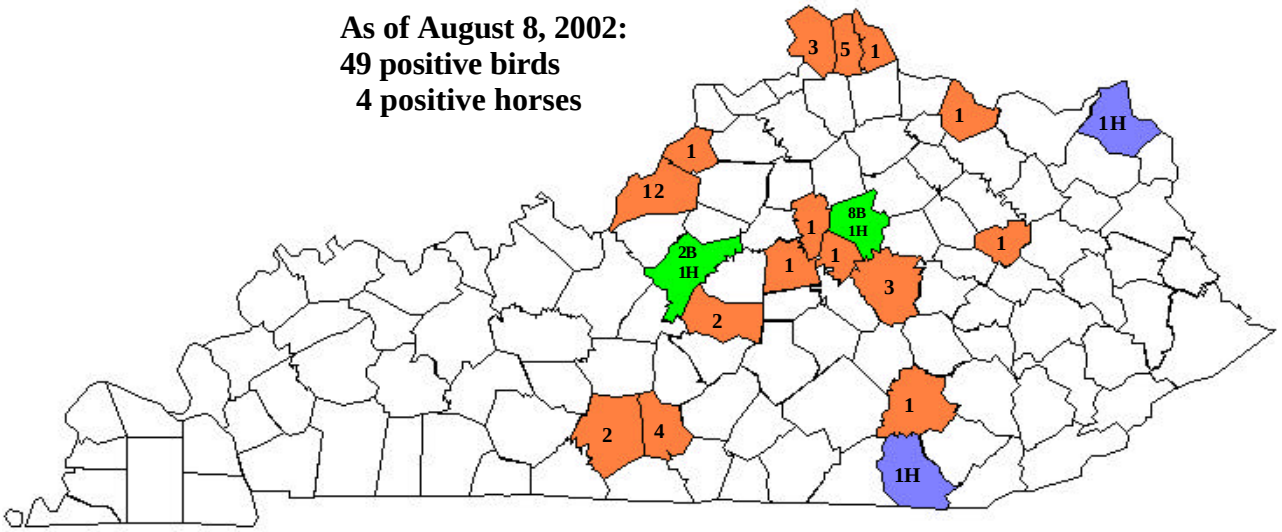
Kentucky Counties with Positive West Nile Virus Activity in 2002

As of August 8, 2002:
49 positive birds
4 positive horses



Birds: **Barren**–1 Grackle, 1 Dove; **Boone**–1 Cardinal, 2 Grackles; **Campbell**–1 Blackbird; **Fayette**–4 Sparrows, 2 Robins, 1 Blue jay, 1 Grackle; **Jefferson**-1 Am. Goldfinch, 3 Blue jays, 2 Crows, 3 Sparrows, 2 Mourning Doves, 1 Robin; **Jessamine**–1 Grackle; **Kenton**–3 Blue jays, 1 Crow, 1 unk.; **Laurel**–1 Warbler; **Madison**-1 Crow, 1 Goose, 1 Sparrow; **Marion**-2 Robins; **Mason**– 1 Robin; **Menifee**-1 Crow; **Mercer**-1 Starling; **Metcalfe**–2 Grackles, 1 Robin, 1 Sparrow; **Nelson**-1 House Finch, 1 Robin; **Oldham** -1 Blackbird; **Woodford**–1 Crow.

Horses: **Fayette**—2; **Greenup**—1; **Nelson**—1; **Whitley**—1