



## **The Kentucky Department for Public Health's Community Fluoridation Program**

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One of the primary program areas for the Kentucky Department for Public Health's Oral Health Program is community water fluoridation, which includes both fluoride enforcement and surveillance. Led by program manager Robert Murphy, the community fluoridation team travels throughout the state monitoring public water systems from Pikeville to Paducah. In 2004, 99.6% of Kentucky's public water systems were providing fluoridated water to their customers. This ranked Kentucky first among all states. Ninety percent of all Kentucky's 4.1 million residents receive optimally fluoridated water. The remaining 10% of Kentuckians have wells, cisterns or springs as their water source.

### **Definition and History of Water Fluoridation**

Water fluoridation is defined as the deliberate upward adjustment of fluorine, a natural trace element, using guidelines developed by scientific and medical research for the purpose of promoting public health through the prevention of tooth decay. Fluoride is present in small but widely varying amounts in most soils, water supplies, plants and animals. The highest concentrations in mammals are found in the bones and teeth. All public water supplies in the U.S. contain at least trace elements of natural fluoride.

Ninety percent of all Kentucky residents receive optimally fluoridated water. The optimal fluoridation level for an area is determined by the annual average daily high temperature (the warmer the climate, the greater volume of water consumed, resulting in a lower optimal level). Kentucky's average high falls between 63.9 – 70.6°F, making its optimal fluoride level 0.90 ppm (parts per million).

The optimal fluoride level ranges from 1.2 ppm in the northern US to 0.7 ppm in the southern US. Water fluoridation in Kentucky began in Maysville and Louisville in 1951. In the 1960's, Kentucky's legislature changed the law to require public water systems to be fluoridated. This was challenged in court and the court of appeals upheld the state's right to require public water systems to fluoridate their water. The Natural Resources Cabinet was responsible for regulating fluoridation until 1994 when the Department for Public Health's Oral Health Program took over the regulatory enforcement of public water system fluoridation.

### **Public Health Benefits of Community Water Fluoridation**

The highest rate of tooth decay is found in school children. It begins early in childhood, reaches a peak in adolescence, and diminishes during adulthood. Fluoride contributes substantial benefits in the prevention of tooth decay. Numerous studies clearly establish a relationship between water fluoridation and the prevention of dental decay. While dental decay is reduced by fluoridated toothpaste and mouth rinses, professional fluoride treatments, and fluoride dietary supplements, fluoridation of water is the most cost-effective method. It provides the greatest benefit to those who can least afford preventive and restorative dentistry. Fluoridation also reduces dental disease, loss of teeth and time away from work or school. Studies have shown that drinking fluoridated water reduces caries 20 to 40% over a lifetime as compared to drinking non-fluoridated water.

Strong evidence now exists that water fluoridation

not only makes the tooth more resistant to bacterial acids, but also inhibits the growth of certain kinds of bacteria that produce these acids. Fluoride has also been shown to aid in the re-mineralization of the tooth, reversing the decay process after it already has begun. The cost of fluoridation is about 73 cents per person per year. The benefits of fluoridation can last a lifetime if one continues to consume fluoridated water.

### **Kentucky Fluoride Enforcement and Surveillance Program**

#### **Community Water Fluoridation Program**

Fluoridation is mandated by Kentucky Administrative Regulation 115:010, with participating water plants required to perform a daily fluoride test. Plants must submit two samples a month (usually the 1<sup>st</sup> and 3<sup>rd</sup> week) to a state certified laboratory for testing. The average of these two samples must range between 0.80 and 1.4 ppm to be in compliance with Kentucky Administrative Regulations and water plants must also pass an annual fluoridation inspection. The regulatory categories are based upon the population served by the water plants with details as described in Table 1. Additional details concerning regulations can be obtained by contacting the community fluoridation administrator listed at the conclusion of this article.

**TABLE 1. Kentucky Community Fluoride Regulation Categories**

<u>Fluoridation Category</u>	<u>Population Served</u>	<u># Participating Water Plants</u>
Mandatory	3,000+	139
Semi-Voluntary	1,500 to 2,999	39
Voluntary	Less than 1,500	28

Since the Oral Health Program took over enforcement of the fluoride program in 1994, water plant compliance has risen from 88% to 99.6% in 2004. The program's four field personnel (located in Martin, Harlan, Franklin and Marshall Counties) completed 206 inspection visits and 203 technical assistance visits to water plants in 2004. Additionally, the staff conducts fluoride training at water association seminars where water plant operators receive continuing education credits.

#### **Rural School Fluoridation Program**

In small rural communities where public water is not fluoridated, the Oral Health Program is responsible for the Rural School Fluoridation Program. At its peak in the early 1980's there were 150 schools participating in this program. Because of the expansion of fluoridated water lines to these schools, only 12 schools participated in this program in 2004. These schools are located in Breathitt, Carlisle, Graves, Knott, Letcher and Perry counties. Field staff is responsible for installation, routine and summer maintenance of the school fluoridation equipment, and training of school staff to perform daily testing. The Oral Health Program office mails out test kits weekly that are processed by school personnel and returned to the state lab for fluoride testing. During the 2003-04 school year, field staff conducted 86 school visits.

The optimal fluoride level for schools in Kentucky is 4.1 ppm, which is higher than the level for individuals receiving daily community water fluoridation because children are only exposed to this level for a short period of time while attending class at participating schools. Schools were 99% compliant for optimal fluoride levels during the 2003-04 school year. Additional fluoridation information will be discussed in future Kentucky Epi Notes issues, including fluoride supplementation for children and how local health departments can assist individuals in testing private wells and cisterns to determine fluoride levels. Questions about Kentucky's Community Fluoridation Program may be directed to Robert Murphy at (502) 564-3246 ext. 3778.

## Sexually Transmitted Disease Morbidity Trends in Kentucky

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Continued progress has been made in sexually transmitted disease (STD) control in Kentucky. Rates of reported gonorrhea and syphilis have generally declined over the past ten years but chlamydia reports, due to increased testing and improved test methods, have risen. While STDs are reported in people of all ages, patients between 15 and 24 years old accounted for 77% of reported chlamydia cases and 62% of reported gonorrhea cases in 2004. However, patients reported with syphilis were typically older (83% being 30 years of age or older).

Chlamydia has been the most frequently reported sexually transmitted disease in Kentucky since 1994. Chlamydia infections are endemic in all areas of the state. Out of the 120 counties in Kentucky, 119 reported chlamydia morbidity in 2004. The number of reported chlamydia cases has dramatically increased from 1986-2002, likely due to expanded screening rather than an actual increase in chlamydia disease (Graph 1, page 4). Prior to 1984, chlamydia was often incorrectly diagnosed as non-gonococcal urethritis (NGU), nonspecific vaginitis (NSV), or the disease was undetected. With the development of easier and less expensive diagnostic tests involving techniques such as nucleic acid probes, large scale screening programs were developed, which resulted in improved measurement of chlamydia infection in Kentucky communities. Testing for chlamydia in local health department clinics has increased 20 fold since 1985 with over 85,000 tests performed in 2004. The increased ability to screen large populations has resulted in a more accurate indication of chlamydia prevalence in Kentucky.

Reported gonorrhea morbidity has shown a steady decline over the past two decades. In 2004, 2,758 cases were reported compared to 8,764 cases in 1986 (Graph 2, page 4). Ninety-eight Kentucky counties reported gonorrhea cases in 2004, but the disease is disproportionately reported from larger towns and cities.

Early syphilis (primary, secondary and early latent

disease stages) rates have declined 85% since 1993 when 487 cases were reported compared to 71 in 2004. Only 14 counties reported early syphilis cases in 2004, but 48 (68%) of the patients were residents of Jefferson County and most resided within the city limits of Louisville (Table 1, page 4). In calendar year 2002, 77 cases of infectious syphilis (the primary and secondary stages of syphilis) were reported among Louisville-Jefferson County residents, ranking 13th highest nationally. In 2003, the number of infectious cases in the area was reduced to 26 with a national ranking of 34th highest. Unfortunately, primary and secondary syphilis case reports in the area for 2004 increased to 33 reports, and from reporting through June 2005 it is projected that the case numbers for 2005 will be the same or at a slightly higher level.

Reported syphilis cases and the subsequent rates have proven to be variable in the past due to a relatively low incidence and the tendency for the disease to become quickly endemic in sub-population groups. In the 1970's and 80's, syphilis became endemic in men who have sex with men (MSM). In the 1990's, individuals who used cocaine and their sexual partners were the most likely to be reported with syphilis. Since 2000 there has been a return of endemic syphilis in MSM in Kentucky. Between January 1 and June 27, 2005, 27 of 32 patients (84%) reported with early syphilis statewide were MSM and 23 were also coinfecting with HIV or AIDS disease. The national trend is similar.

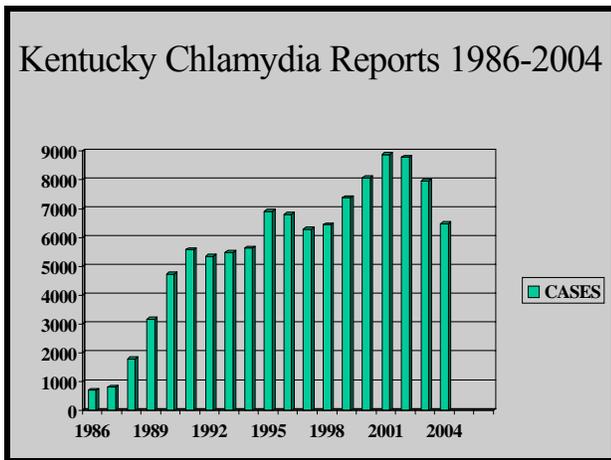
On October 1, 2004, the Kentucky Division of Laboratory Services and the Louisville-Jefferson Metro Health Department's Health Laboratory initiated a nucleic acid amplified test (NAAT) to detect chlamydia and gonorrhea infection. This test has proven to be more sensitive than previous methods, and subsequently, the positivity rate for chlamydia at screening sites has increased from 4.09% to 7.28% when comparing screening data collected from October 2004 to March 2005 with screens collected between October 2003 to March

*(Continued on Page 4)*

2004 (Table 2 below). While far less dramatic, the gonorrhea positivity rate also increased from 1.25% to 1.43%. Based on these findings, it is logical to expect that the number of reported cases of chlamydia will increase in 2005 and the number of gonorrhea cases will likely increase slightly over the number of cases reported in 2004.

The Kentucky Department for Public Health’s STD Program continues to provide an array of screening, diagnostic, treatment, and epidemiologic services directed toward improved prevention and control of STD in Kentucky. With ongoing efforts to educate populations at risk, utilization of current appropriate therapies, and assurance of the latest diagnostic technologies, the program has been improving public health management of STD in the Commonwealth of Kentucky.

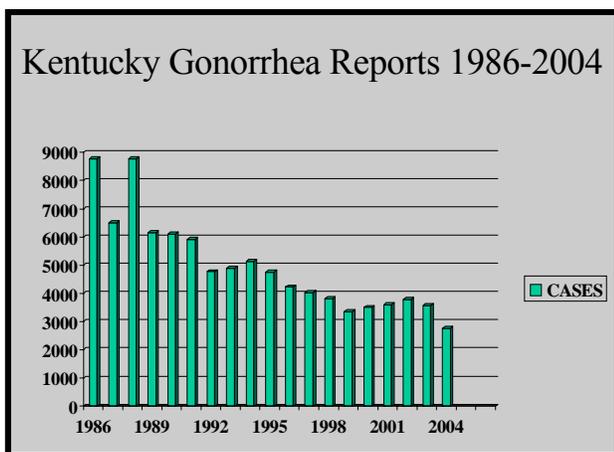
**GRAPH 1. Kentucky Chlamydia Reports 1986-2004**



**TABLE 1. Counties Reporting Early Syphilis 2004**

JEFFERSON	48	GRAVES	1
FAYETTE	7	HARDIN	1
KENTON	2	HENRY	1
LAUREL	2	JESSAMINE	1
MCCRACKEN	2	LOGAN	1
TODD	2	MADISON	1
CHRISTIAN	1	UNION	1

**GRAPH 2. Kentucky Gonorrhea Reports 1986-2004**



**TABLE 2. Comparison of ELISA and Enhanced NAAT Testing Methods**

	ELISA OCTOBER 2003- MARCH 2004	NAAT OCTOBER 2004- MARCH 2005
TESTS PERFORMED	33,335	32,764
POSITIVE FOR CHLAMYDIA	1,366	2,386
PERCENT POSITIVE	4.09	7.28
POSITIVE FOR GONORRHEA	420	469
PERCENT POSITIVE	1.25	1.43

## Overweight Adolescents and Type 2 Diabetes

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The combination of increasing size and weight of our nation's adolescents, fueled by excessive calorie intake and little to no physical activity, is beginning to become evident as more adults and children are developing chronic diseases. Overweight and obesity substantially increase the risk of morbidity and mortality from hypertension, type 2 diabetes, coronary heart disease and stroke, to name a few. Many U.S. states have begun to implement steps to turn this tide. Kentucky has carved out a recent legislative victory to improve its school health environment with the signing of Senate Bill 172. While regulations concerning this legislation are being reviewed, the opportunity exists for the public to comment.

Obesity trends are alarming and the indicators are not improving. The National Health and Nutrition Examination Survey (NHANES) revealed that overweight, obesity, and physical inactivity have increased significantly among adults and children. For additional data on NHANES, refer to the June 2005 edition of Kentucky Epidemiologic Notes & Reports. According to a 2004 report by the Kentucky Department for Public Health's Obesity and Chronic Disease Prevention Program, almost 63% of adults in Kentucky are overweight or obese. In addition, nearly 30% of Kentucky's high school students and over 34% of its middle school students are overweight or at risk of overweight. Among the youngest Kentuckians, 35% of children aged 2-4 are already overweight or at risk for overweight.

A particular concern of overweight adolescents is the relationship of excess body weight to the risk of type 2 diabetes. Until recently, type 2 diabetes has been primarily seen in overweight and inactive adults. However, as the typical American child is becoming less active and eating a diet higher in caloric content, more children and adolescents are being diagnosed with type 2 diabetes. The 2004 report by the Kentucky Department for Public Health's Obesity and Chronic Disease Prevention Program also revealed that 13% of Kentucky's high school

students have been told by a health care professional that they are at risk of developing diabetes. Only 13% of Kentucky's high school students meet the five-a-day guideline of consuming five or more daily servings of fruits and vegetables. Almost half of these students buy sodas at least once a day from school vending machines and 31% of these high school students watch more than 3 hours of television each day. In addition, 1 in 10 gets no physical

### Kentucky Senate Bill 172 Criteria

- Provide specific credentialing and annual nutrition education hours for persons responsible for meal planning
- Limit retail fast food in the cafeteria to one time per week
- Restrict competitive beverage sales in elementary schools to school day approved beverages (water, 100% fruit juice, low fat milk and beverages containing no more than 10 grams of sugar per serving)
- Establish competitive food violation penalties
- Require site-based councils to develop and implement a policy for daily physical activity in elementary schools that allows up to 30 minutes of physical activity to be counted as instructional time
- Require an annual report on the school nutrition and physical activity environment
- Require the Kentucky Board of Education to promulgate regulations addressing the nutritional content of foods and beverages sold in school stores, vending machines, canteen and a la carte sales.

activity, with only 1 out of 3 enrolled in PE class. Nationally, Kentucky has the highest percentage of persons lacking physical activity and ranks 5<sup>th</sup> for highest prevalence of obesity among those 18 years and older.

The Kentucky Board of Education (KBE) has completed its first draft of nutritional regulations

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for the above items and can be viewed at <http://www.education.ky.gov/users/spalmer/702%20KAR%206090.pdf>. See Table 2 below for the nutritional regulation criteria contained in the draft. These regulations are currently undergoing review by various stakeholders working with the Kentucky Department of Education. A second draft of the regulation will be presented at the next state board meeting in August 2005, at which time the KBE plans to vote on the regulation. Those wishing to weigh in on the regulation development should contact KBE members and express their opinion, as this serves as an excellent opportunity for public comment on the regulation as it is being developed. For further information, please contact Dawn Frazee at (270) 769-1601 Ext. 129 or email at [dawns.fraze@ky.gov](mailto:dawns.fraze@ky.gov). References for this article will be furnished upon request.

**TABLE 1. Kentucky Board of Education's Draft Nutritional Regulations for Kentucky Schools**

<u>Beverage Criteria</u>
• Milk containing no more than 2% fat
• Only 100% fruit and/or vegetable juice or any other beverage containing no more than 10 grams of sugar per serving
• Sodium content not exceeding 40 mg per serving
• Caffeine-free
• Volume size not exceeding 16 ounces (except for unflavored, unsweetened, non-carbonated water)
<u>Food Criteria</u>
• Calories from fat shall not exceed 30% with no more than 10% saturated fat
• Calories from sugar shall not exceed 32%
• Sodium will be restricted on specific food items
• Chewing gum and hard candies will be prohibited
• Limited portion sizes for specific items