



# Community & Hospital Letter

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## Preterm Births & Infant Mortality

One of the key indicators cited as a measure of population health is the infant mortality rate (IMR). This rate measures the risk of dying during the first year of life among infants born alive. The rate ignores the fact that not all infants who die during a calendar year were born in that calendar year, and assumes that deaths balance out over time. It is based on the number of infant deaths during the calendar year divided by the number of live births that year, and multiplied by 1,000 live births. In 2004, Kansas City's IMR was 8.2, while Missouri's was 7.5. The national Year 2010 objective is an IMR of 5.0.

Obviously infants can die from many causes. However, a new analysis of infant deaths by the Center's for Disease Control and Prevention (CDC), concluded that preterm birth (<37 weeks gestation) is the most frequent cause of infant death in the United States, accounting for at least one third of the deaths (*Pediatrics* 2006;118:1566-1573). Ninety-five percent of those deaths occurred among infants who were born at <32 weeks gestation and weighed <1,500 (3 lb 4 oz), with two thirds of those deaths occurring in the first 24 hours of life.

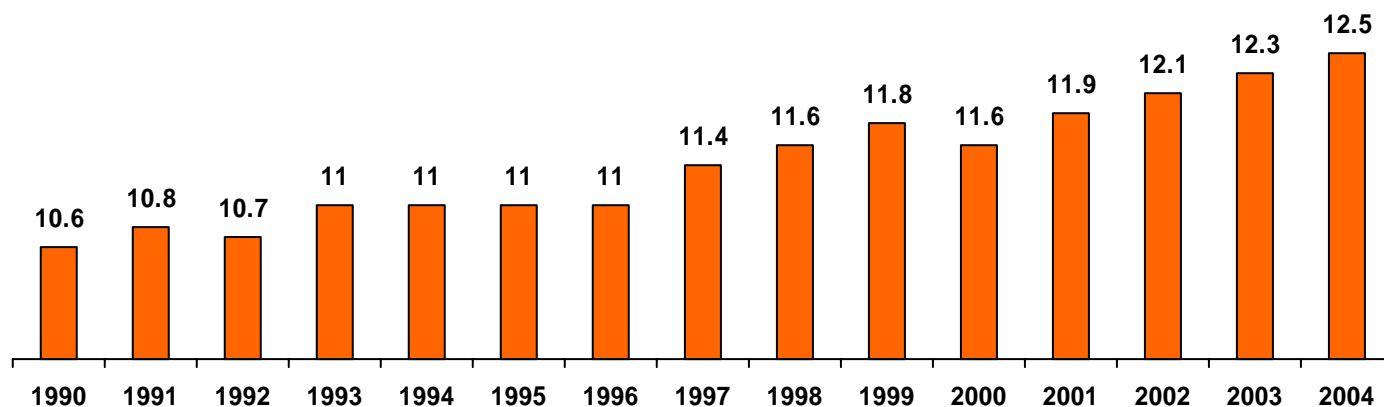
Infants born preterm are at greater risk than infants born at term for mortality and a variety of health and developmental problems. The greatest risk is for those infants born at the earliest gestational age. However, infants born nearer to term represent the greatest number of infants born preterm and also experience more complications than infants born at term.

In 2004, 12.5% of births in the US and 9.9% in Kansas City were preterm (national Year 2010 objective is 7.6%). Because the preterm birth rate in nation has been increasing steadily in the past decade (up 18% from 1990; Figure 1) and because there are significant, persistent, and very troubling racial, ethnic, and socioeconomic disparities in the rates of preterm births, the Institute of Medicine convened a conference on the topic. The report of that conference can be found at [www.nap.edu](http://www.nap.edu).

Concurrent with the increasing number of preterm births is trend toward lower birthweights (Figure 2). Low birthweight (<2,500 grams or 5 lb 8 oz) accompanies preterm



Figure 1 Percentage of preterm births, United States, 1990-2004

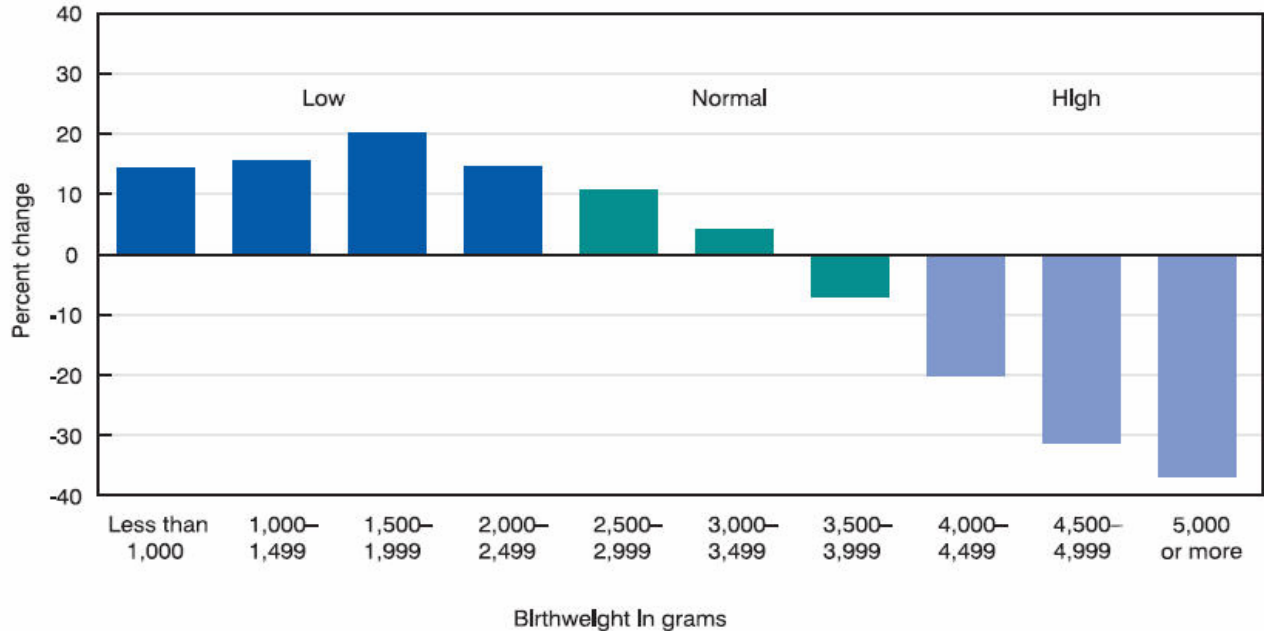


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births and is considered by many to be the risk factor most closely associated with neonatal death (*Pediatrics* 2004;117:168-183). Mortality among low birthweight infants accounts for 66% of overall infant mortality (*Nat Vital Stat Report* 2006;55(1):1-102). Of all infants born at low birthweight, the smallest (those weighing <1,500 grams) are at the highest risk of dying in their first year. Their risk of dying in the first year is 100 times that of normal weight infants, while that of moderately low birthweight infants (1,500-2,499 grams) is 5 times higher than that for normal weight infants.

In 2004, the national low birthweight rate was 8.1%, the highest level reported since 1969. The percentage of infants born at <2,500 grams has increased 16% since 1990. In contrast, large reductions in the percentage of heavier birthweight infants (3,500 grams or 7 lb 12 oz or more) have occurred. In Kansas City, the low birthweight rate in 2004 was 8.8% (1.8 % for infants <1,500 grams, 6.9% for infants 1,500-2,499 grams) and has remained relatively constant since 2000. The national Year 2010 objective is 5.0% for all babies <2,500 grams and 0.9% of those <1,500 grams.

**Figure 2** Change in birthweight distribution, United States, 1990 and 2004 (adapted from National Center for Health Statistics, *Births: Final Data for 2004*. NVSS 55(1), 9/29/06)



## Potpourri

**WHY DO EPIDEMIOLOGISTS** tend to focus on the maternal contribution to outcomes of pregnancy and rarely examine the paternal contribution? After all, parental age has been associated with schizophrenia (*Brit Med J* 2004; 329:1070-1073), autism (*Arch Gen Psychiatry* 2006;63:1026-1032) and various genetic diseases in children, as well as other issues such as length of pregnancy (*Obstet Gynecol* 2006;107:880-885).

There are three main difficulties in trying to study paternal contributions. First, the majority of issues to which paternal contributions have been associated occur later in the infant's life, so an epidemiologist must be able to access some sort of "registry" or database that captures the occurrence of such events. Second, a significant amount of maternal contribution is based on information recorded on birth certificates. However, birth certificates

have little information concerning the father as compared to the mother. And third, there is the issue of paternity. Based on an analysis of the literature, a conservative estimate is that 4% or as many as one out of every 25 fathers could be unknowingly raising another man's child (*J Epidemiol Community Health* 2005;59:749-754). This number could change significantly as the soaring rates of paternity testing in the US are examined and as genetic testing is increasingly used for the diagnosis and treatment of disease as well as in judicial procedures. Even at 4%, paternal discrepancies potentially could skew analyses of infrequent disease conditions in children that are presumed, by the epidemiologist, to be biologically related to the father.

**THE ADVISORY COMMITTEE** on Immunizations Practices (ACIP) has recommended that the new shingles (herpes zoster) vaccine be administered to everyone over the age of 60. Consequently, both health care insurers and Medicare are studying whether or not they will cover the cost of this vaccine (~\$160 per dose). The risk of shingles rises with increasing age with about 50% of persons experiencing this painful and sometime debilitating condition by age 85 y. Among younger adults (25-64 y old), women are more likely to experience shingles than men (*Ann Epidemiol* 2006;16:692-695).

Shingles causes a rash with blisters that usually lasts for two to four weeks. The pain associated with the blisters can be quite intense. Once this initial phase is over, nerve pain called postherpetic neuralgia can set in. This pain lasts anywhere from 30 days to months or even years. It can be so severe in some people that it disrupts their lives. Postherpetic neuralgia is more common in people older than 60. It occurs in less than 10% of people younger than 60 after a bout of shingles but in more than 40% of people older than 60.

The illness is caused by varicella, the same virus that causes chickenpox. Shingles occurs when the chickenpox virus lying dormant in nerve cells "wakes up" in older people or others with health problems. The vaccine is actually a boosted dose of the chickenpox vaccine currently given to children.

**ONLY 23% OF WOMEN** infected with human papillomavirus (HPV) became pregnant during in-vitro fertility treatments, compared to 57% of uninfected women (*Fertility Sterility* 2006;86:765-767).

**THE MOST CURRENT VERSION** of the *International Classification of Diseases* (ICD) is used to both classify cases of morbidity and mortality as well as to extract information from related databases. Much of our understanding of population health relies on ICD coding. So how good is the coding?

A recent publication examined ICD 9<sup>th</sup> revision, clinical modification codes for identification of specific allergic reactions seen in emergency departments (*Ann Epidemiol* 2006;16:696-700). The authors reported that almost half of the patients with food allergy would have been missed by using food-specific *ICD-9-CM* codes alone, whereas only 13% of patients with insect sting allergy would have been missed. They concluded that characteristics of these allergy patients would have been biased by studying only patients identified by using the allergen-specific *ICD-9-CM* codes.

**BETWEEN THE** 1<sup>st</sup> of May and the 31<sup>st</sup> of December 2005, 846 confirmed cases of *Shigella sonnei* infections were identified on both sides of the Kansas City metropolitan area. Of 88 isolates tested for antibiotic sensitivity, 78 were resistant to the antibiotics ampicillin and TMP/SMX; none were resistant to ceftriaxone or ciprofloxacin (*MMWR* 2006;55:1068-1071).

**KILL THE BACTERIA,** kill the worm, improve the patient's disease may soon be the standard mantra when treating persons with lymphatic filariasis. This disease is a mosquito transmitted nematode parasitic disease that causes severe swelling in the limbs or scrotum. It is known by most people as elephantiasis. It is a disease of considerable burden, affecting 120 million people, mainly in the tropics. Persons who are infected often cannot work or marry, and can be shunned by others in their villages because of their disfigurement.

Following the bite of an infected mosquito, the filarial worms invade the person's lymphatic system where they

produce millions of larvae which are then spread throughout the bloodstream. It is unclear whether the swelling, or lymphoedema, that occurs results from the obstruction of the lymphatic vessels or from the body's immune response. Existing drug treatments kill the larvae to prevent mosquitoes from acquiring and transmitting the parasite, but do not affect the adult worms. Treatments also do not halt the progression of symptoms once the disease has developed.

In an effort to find a drug that will kill the adult worms and halt the progression of the disease, researchers from the Liverpool School of Tropical Medicine treated patients with the antibiotic doxycycline (*PloS Pathogens* 2006;2(9):e92). The antibiotic killed the *Wolbachia* bacteria living inside the worms, eventually leading to the death of the adult worms and a significant improvement in symptoms of the disease.

*Wolbachia* bacteria are endosymbionts of filarial worms and, in general, *Wolbachia* are known to cause or contribute to many disease producing mechanisms of infection. While the actual mechanism of elephantiasis is still open to debate, treating bacterial infections, whether in the worms themselves or in secondary infections, offers inexpensive adjunct therapy for persons afflicted with this disease while improving their quality of life.

**THE NATIONAL SPINA BIFIDA** (failure of the spinal column to properly enclose the spinal cord) rate has been stable since 1999, with the 2004 rate at 19.56 per 100,000 live births (*National Center for Health Statistics, Health E-Stats*, 10/2006, [www.cdc.gov/nchs](http://www.cdc.gov/nchs)). In 2004, the national rate for anencephalus (absence of the brain) was 10.39 per 100,000 live births. Both spina bifida and anencephalus are considered underreported on birth certificates. In Kansas City, birth certificates indicated that there were 9 babies born with spina bifida and 2 with anencephalus between the years 2000 and 2004.

**MATERNAL PERIODONTAL DISEASE** has been associated with an increased risk of preterm birth and low birthweight. While treatment of periodontitis in preg-

nant women improves periodontal disease and is safe, it does not significantly alter rates of preterm birth, low birth weight, or fetal growth restriction. These are the conclusions of ClinicalTrials.gov number, NCT00066131 (*N Engl J Med* 2006;355:1885-1894).

**HERE ARE** some facts you may not have been aware of concerning Kansas City area's contributions to animal health ([www.kcanimalhealth.com](http://www.kcanimalhealth.com)).

- Nearly one third of the \$14.2 billion global animal health industry is represented by companies in the greater Kansas City area.
- Kansas City has the largest concentration of animal health companies in the world: 23 animal health manufacturers; 17 animal nutrition companies; 9 animal health distributors; 41 suppliers to animal health products; and 26 service providers.
- 45 animal health companies have US or global headquarters in Kansas City; 4 of the 10 largest global animal health companies; 1 of the 5 largest global pet food companies; and the world's largest animal health generics manufacturer; two more animal health companies will shortly be moving into the Kansas City area.
- Within 350 miles of the KC Animal Health Corridor are more than 45% of the feed cattle in the US, more than 40% of US hogs, and 20% of US beef cows and calves.

A piece of trivia: in 1860, the first processed dog food was introduced by James Spratt, of Cincinnati, Ohio who developed a biscuit made of wheat, beet root, vegetables and beef blood. His inspiration for this product came from watching stray dogs eat hardtack thrown away by sailors off ships in port. The name of this new product was called Spratt's Patent Meat Fibrine Dog Cakes. Other companies quickly jumped on the bandwagon, and more baked dog products were on the market. Some offered paid endorsements by veterinarians, while others made claims to cure a dog of worms and certain diseases.

**Healthy People, Healthy Communities**

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