National Institutes of Health

Fact Sheet — *Infant Health*

Thirty Years Ago

During the mid-1970s, premature infants with severe lung problems rarely survived. Earlier, in 1963, the nation watched helplessly as then President Kennedy and his wife Jacqueline lost their newborn son, Patrick Bouvier Kennedy, to respiratory distress syndrome. As with many premature infants, Patrick's lungs were not sufficiently developed to take in the oxygen he needed to survive. In 1976, the infant mortality rate was more than twice what it is today, with an average of 15.2 deaths for every 1000 infants born each year.

Today

A sustained, long-term, public and private effort — informed in large part by NIH research — led to substantial improvements in infant care and survival. Premature infants are kept alive in specialized hospital units known as neonatal intensive care units. They're cared for in the controlled environment of an incubator, which keeps them warm and isolates them from disease organisms. By 2003, the most recent year for which infant mortality statistics are available, the infant mortality rate was 6.8 per 1000 births, less than half the 1976 rate. Research advances have led to treatments that could avert the breathing problems that took the life of Patrick Kennedy and many other premature infants.

- *Surfactant therapy*. Many premature infants have difficulty breathing because their lungs do not produce surfactant, a substance that prevents the air sacs within the lungs from collapsing and keeps the inside of the lungs from sticking together. NIH-supported research in the 1980s and 1990s showed that treating infants' lungs with an artificial form of surfactant keeps the air sacs open and makes breathing possible.

Mother to child HIV transmission. Acquired Immune Deficiency Syndrome was unknown 30 years ago. In 2006, more than 1 million Americans were infected with the human immunodeficiency virus (HIV). Women can transmit the virus to their infants during pregnancy, labor, delivery, or breast feeding. The yearly total of children infected with HIV before or during birth peaked in 1992, at an estimated total of 1,760 in the United States.

- By 2004, the yearly total for children diagnosed with HIV before or during birth had fallen to an estimated 144 to 236. The drop resulted from better identification of women with HIV infection and from new treatments. These advances came largely from a major investment by the NIH. Rapid, accurate, and inexpensive HIV testing made it possible to screen large numbers of pregnant women at risk for HIV infection. New anti-HIV drug combinations made it less likely that babies would be infected in the womb or during birth. The discovery that HIV could be transmitted through breast milk made it more likely that women would formula feed their infants when possible, eliminating another means of infection.

Premature Birth. In 2004, 12.5 percent of U.S. infants—or 1 in 8—were born prematurely. The causes of premature birth are not well understood. In addition to a greater risk of death during the first year of life, premature infants are also at higher than normal risk for life long complications such as cerebral palsy, chronic lung disease, gastrointestinal problems, mental retardation, vision loss and hearing loss. As adults, premature infants may face a higher than normal risk for heart disease and diabetes. Through NIH research, physicians now have the means to prevent at least some premature births from occurring:

- *Weekly progesterone injections*. In 2003, NIH-supported researchers conducted a randomized study of 493 pregnant women who had given birth prematurely in a previous pregnancy, treating them with weekly injections of the hormone progesterone. Progesterone lowered the risk of a second preterm birth by one-third.

Sudden Infant Death Syndrome, or SIDS, claims the lives of roughly 50 out of 100,000 U.S. infants each year. SIDS refers to the unexplained death of an otherwise healthy infant during the first year of life. Although the cause of SIDS is unknown, decades of painstaking research supported by the NIH identified the major risk factors for SIDS, as well as the means to reduce the odds of death from SIDS.

- *The Back to Sleep Campaign*. The Back to Sleep campaign resulted from a body of research that showed infants who sleep on their backs are less likely to die of SIDS than are infants who sleep on their stomachs. Led by NIH, the campaign is a public-private partnership between federal agencies and various private organizations. Since the campaign began in 1994, the SIDS rate has declined by more than 50 percent. The campaign works with community groups to build grass roots efforts that teach new parents and caregivers to place infants on their backs to sleep, both at nap time and at night time. The Back to Sleep campaign also lists other recommendations for reducing SIDS risk on its Web site, http://www.nichd.nih.gov/sids.

Neural Tube Defects. Neural tube defects are serious birth defects affecting the brain and spinal cord. In one type, spina bifida, a piece of the spinal cord protrudes from the spinal column, causing paralysis below the protrusion. In anencephaly, a fatal neural tube defect, the brain and skull are grossly underdeveloped.

- *Prevention through nutrition.* A large body of both NIH-supported and international research has shown that the occurrence of neural tube defects could be reduced by 50 to 70 percent if women consumed sufficient amounts of the B vitamin folate in the weeks before and after conceiving a child. Folate is naturally available in grains, green leafy vegetables, and in vitamin supplements, such as folic acid. Because many women fail to consume the 400 micrograms of the vitamin needed to prevent neural tube defects, in 1996 the Food and Drug Administration mandated that all grain products sold in the U.S. be fortified with folic acid. Since the fortification, the number of these birth defects has declined from 4000 to 3000 per year.

Tomorrow

A leading cause of infant mortality is low birth weight — a classification that includes both premature infants and those small for their gestational age. Because premature birth plays such a large role in infant death and disability, much NIH research seeks to prevent preterm birth from occurring. Other on-going NIH research seeks to understand and prevent the causes of infant mortality and illness.

- *Progesterone and multiple births.* A study is now under way to test whether the weekly progesterone injections that reduced the chances of preterm birth in women carrying one baby will also reduce preterm birth among women pregnant with twins or triplets, a group also at risk for giving birth early.

- Omega 3 fatty acids and preterm births. Evidence from European studies suggests that the Omega 3 fatty acids found in deep sea fish may reduce the chances of preterm birth. In this study, women receiving weekly progesterone injections will receive supplements containing the Omega 3 fatty acids docosahexanoic acid and eicosapentanoic acid. The researchers hope to determine whether the addition of the Omega 3 fatty acids will result in greater reduction of preterm birth than progesterone alone.

- *Understanding stillbirth*. Each year, more than 26,000 American women are reported to experience a stillbirth, the death of a fetus at 20 or more weeks of pregnancy. The number of reported deaths from stillbirth is equal to that of all infant deaths combined. Some causes of stillbirth are known, such as diabetes or high blood pressure affecting the mother. However, the cause of more than half of all stillbirths is unknown. Improved understanding of stillbirth may lead to ways to prevent it. The NIH-supported Stillbirth Research Collaborative Network is working with local hospitals to determine the scope and causes of stillbirth among varied populations in the United States.

- Correcting spina bifida. Consuming adequate amounts of folic acid greatly reduces but does not eliminate the risk of spina bifida. With the most severe forms, the spinal cord may be exposed through an opening in the bones of the spinal column. This may result in partial or complete paralysis of the area below the spinal opening. The NIH is conducting a large study to determine whether a new surgery to correct spina bifida in the womb is safer and more effective than the traditional after-birth surgery to correct the disorder.