

Behind the Numbers

For a look at more data and discussion, go to pages 6 and 9.



Low Birth Weight

“Low Birth Weight” is one of the indicators that the FCFC tracks under the Healthy People Outcome. While this indicator has fluctuated over the past two decades (see page 9), the historical trend for Montgomery County (as well as for the state and the nation) is not in the desired direction.

Due to concerns about this trend a local Low Birth Weight Registry was launched in 2007. An update on the registry's findings can be found on page 7 as part of the Healthy People Outcome Team Report. Here we want to look at why this indicator is so important.

According to the March of Dimes,¹ babies born with a low birth weight – defined as less than 2,500 grams or 5 lbs. 8 oz. – are at increased risk for a host of medical problems as newborns, including:

- Respiratory distress syndrome
- Bleeding in the brain
- Patent ductus arteriosus (a heart problem)
- Necrotizing enterocolitis (an intestinal problem)

In addition, these babies have a mortality rate in their first month of life that is “up to 12 times” higher than the rate observed for babies whose birth weight is more appropriate for their gestational age.²

By themselves, these concerns about infant morbidity and mortality are sufficient to make low birth weight an indicator of interest. However, the negative health

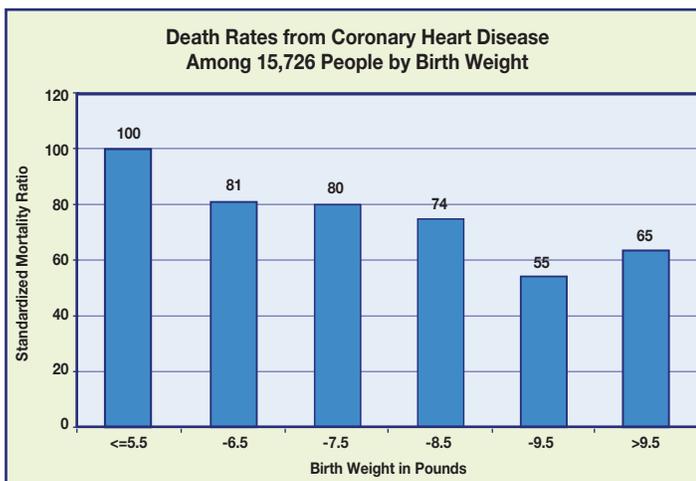


Figure 1. People born weighing less than 5.5 pounds have the highest risk of dying from coronary heart disease when they are adults. The “standardized mortality ratio” is a way to compare these rates; for example, the death rate for people born weighing between 8.5 and 9.5 pounds is only 55% of the death rate for people born weighing less than 5.5 pounds. (Source: Barker, D.J.P., 1997)

outcomes associated with a low birth weight are not restricted to the period of infancy. Adults who were born with a low birth weight have been shown to be at higher risk for hypertension,³ stroke,⁴ type II diabetes,⁵ coronary heart disease,⁶ and death due to cardiovascular disease.⁷ A clear illustration of this latter risk is shown in Figure 1, based on an analysis of detailed longitudinal health records available in one area of Great Britain.

All of these data show that a low birth weight is *correlated* with future health problems, but they do not show that having a low birth weight *causes* these problems. Because of this, low birth weight is sometimes considered a “marker,” something identifying people who have experienced an adverse influence which slowed their growth and which can then be related to future health information.

Attempts to understand this initial adverse influence have focused on “fetal programming” which can be described as follows:⁸

Malnutrition and other adverse environmental exposures during development alter gene expression and program the body's structures and functions for life. Adverse exposures also result in slow growth and small body size.

In other words, something is happening during development that causes both a low birth weight and subsequent health problems. The Low Birth Weight Registry may provide some valuable insights that can lead to effective interventions.

¹ March of Dimes, Fact Sheet on Low Birth Weight, May 2008, available at http://www.marchofdimes.com/professionals/14332_1153.asp#head7.

² Research summaries cited by Reyes, L. and Manalich, R., Long-term consequences of low birth weight. *Kidney International*, Vol. 68, Supplement 97, pp. S107–S111, 2005.

³ Wadsworth M.E.J., Cripps H.A., Midwinter R.E., *et al.*, Blood pressure in a national birth cohort at the age of 36 related to social and familial factors, smoking, and body mass. *BMJ* 291:1534–1538, 1985.

⁴ Barker D.P.J., Osmond C., Deaths rates from stroke in England and Wales predicted from post-maternal mortality. *BMJ* 295:83–86, 1987.

⁵ Hales C.N., Barker D.P.J., Clark P.M.S., *et al.*, Fetal and infant growth and impaired glucose tolerance at age 64 years. *BMJ* 303:1019–1022, 1991.

⁶ Eriksson J.G., Forsén T., Tuomilehto J., *et al.*, Early growth and coronary heart disease in later life: longitudinal study. *BMJ* 322:949–953, 2001.

⁷ Barker, D.J.P. Maternal Nutrition, Fetal Nutrition, and Disease in Later Life. *Nutrition* 13:807–813, 1997.

⁸ Barker, D.J.P. “Preventing Chronic Disease,” Keynote address delivered to 15th Annual Maternal and Child Health Epidemiology Conference, Tampa FL, December 9, 2009.