

1 INCREASED RISK OF CARDIOVASCULAR DISEASE

To confirm links between infant nutrition and health risks in later life, British researchers measured blood pressure at 13 to 16 years of age of 216 children who had been born prematurely. For those who had received preterm infant formula or routine infant formula, blood pressure was higher than for those who had received breastmilk during infancy. The authors concluded that for children born prematurely, breastfeeding lowers blood pressure in later life and that this conclusion can be extended to term infants as well.

Singhal A, Cole TJ, Lucas A. Early nutrition in preterm infants and later blood pressure: two cohorts after randomized trials. *The Lancet* 357: 413-419, 2001

This UK study looked at the cholesterol levels of 1500 children aged 13 to 16 years and determined that breastfeeding may have long term benefits for cardiovascular disease by reducing levels of total cholesterol and low-density lipid cholesterol. The research suggests that early exposure to breastmilk may program fat metabolism in later life, resulting in lower blood cholesterol levels and therefore a lower risk of cardiovascular disease.

Owen GC, Whipcup PH, Odoki JA, Cook DG. Infant feeding and blood cholesterol: a study in adolescents and systematic review. *Pediatrics* 110: 597-608, 2002

A prospective study followed 7276 term UK infants for 7.5 years. Full data was available for 4763 children. For those not breastfed both systolic and diastolic pressures were found to be higher than for those who were breastfed at age 7 years. There was a 0.2mm Hg reduction for each 3 months of breastfeeding. The authors suggest there may be significant benefits during adulthood as a 1% reduction in population systolic blood pressure is associated with a 1.5% reduction in overall mortality.

Martin RM, Ness AR, Gunnell D, Emmet P, Smith GD. Does breastfeeding in infancy lower blood pressure in childhood? *Circulation* 109: 1259-1266, 2004

1 INCREASED RISK OF OBESITY

To determine the impact of infant feeding on childhood obesity, this large Scottish study looked at body-mass index of 32,200 children aged 39 to 42 months. After elimination of confounding factors, socioeconomic status, birthweight and sex, the prevalence of obesity was significantly higher in the formula-fed children, leading to the conclusion that formula feeding is associated with an increase in childhood obesity risk.

Armstrong, J. et al. Breastfeeding and lowering the risk of childhood obesity. *Lancet* 359:2003-04, 2004

German researchers collected height and weight data of 9375 school children to determine the impact of early childhood feeding on the development of obesity. The prevalence of obesity was found to be 4.5 per cent – nearly 40 per cent higher – in those who had never been breastfed compared to 2.8 per cent for those who had been exclusively breastfed.

Von Kries R. Breastfeeding and obesity: cross sectional study. *BMJ* 319: 147-150, 1999

In order to determine factors associated with the development of overweight and obesity, 6650 German school-aged children between the ages 5 to 14 years of age were examined. Breastfeeding was found to be protective against obesity. The protective effect was greater when the infants were exclusively breastfed.

Frye C, Heinrich J. Trend and predictors of overweight and obesity in East German children. *Int J of Obesity* 27: 963-969, 2003

Active follow-up of 855 German mother and baby pairs was used to determine the relationship between not breastfeeding and increased risk of overweight and obesity. After a two year follow-up 8.4 per cent of children were overweight and 2.8 per cent severely overweight: 8.9 per cent were never breastfed, while 62.3 per cent were breastfed for at least six months.

Children who were exclusively breastfed more than three months and less than six months had a 20 per cent reduction

risk, while those who had breastfed exclusively for at least six months had a 60 per cent risk reduction for becoming overweight compared to those who were formula fed.

Weyererman M et al. Duration of breastfeeding and risk of overweight in childhood: a prospective birth cohort study from Germany. *Int J Obes advance online publication* February 28, 2006.

13 INCREASED RISK OF GASTROINTESTINAL INFECTIONS

Seven hundred and seventy-six infants from New Brunswick, Canada were assessed for the relationship between respiratory and gastrointestinal illnesses and breastfeeding during the first six months of life. Although the rates of exclusive breastfeeding were low, the results showed a significant protective effect against total illness during the first six months of life. For those breastfed, the incidence of gastrointestinal infections was 47% lower; the rate of respiratory disease was 34% lower than those who were not breastfed.

Beaudry M, Dufour R, Marcoux S. Relationship between infant feeding and infections during the first six months of life. *J Pediatr* 126: 191-197, 1995

A comparison between infants who received primarily breastmilk during the first 12 months of life to infants who were exclusively formula-fed or who were breastfed for three months or less found that diarrheal disease was twice as high for the formula-fed infants then for those who were breastfed.

Dewey KG, Heinig MJ, Nommsen-Rivers LA. Differences in morbidity between breast-fed and formula-fed infants. *J Pediatr* 126: 696-702, 1995

Breastfeeding promotion in Belarus significantly reduced the incidence of gastrointestinal infections by 40 per cent.

Kramer MS, Chalmers B, Hodnett ED, et al. Promotion of Breastfeeding Intervention Trial (PROBIT): A randomized trial in the Republic of Belarus. *JAMA* 285: 413-420, 2001

14 INCREASED RISK OF MORTALITY

The authors of this review discuss the global impact of breastfeeding on child spacing and estimate that exclusive breastfeeding can lead to decreased mortality of 20 per cent when infants are spaced at least two years apart.

Thapa S, Short RV, Potts M. Breast feeding, birth spacing and their effect on child survival. *Nature* 335: 679-682, 1988

Compared with exclusive breastfeeding, children who were partially breastfed had a 4.2 times increased risk of death due to diarrheal disease. Not breastfeeding was associated with a 14.2 times increased risk for death due to diarrheal disease in Brazilian children.

Victoria CG, Smith PG, Patrick J, et al. Infant feeding and deaths due to diarrhea: A case-controlled study. *Amer J Epidemiol* 129: 1032-1041, 1989

Infants in Bangladesh who were partially breastfed or not breastfed had a risk of acute respiratory infection death 2.4 times greater than exclusively breastfed infants. If children were predominantly breastfed the risk of death due to acute respiratory infection was similar to that of exclusively breastfed children.

Arifeen S, Black RE, Atbeknab G, Baqui A, Caulfield L, Becker S. Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. *Pediatrics* 108: e67, 2001

The researchers examined 1204 infants who died between 28 days and 1 year from causes other than congenital anomaly or malignant tumor and 7740 children who were still alive at 1 year to calculate mortality and whether or not the infant was breastfed as well as the duration–response effects.

Children who were never breastfed had a 21% greater risk of dying in the postneonatal period than those who were breastfed. Longer breastfeeding was associated with lower risk. Promoting breastfeeding has the potential to save ~720 postneonatal deaths in the United States each year. In Canada this would be ~ 72 deaths.

Chen A, Rogan WJ. Breastfeeding and the risk of postneonatal death in the United States. *Pediatrics* 113: 435-439, 2004