

# Birth

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## Abstract

### Infant and Neonatal Mortality for Primary Cesarean and Vaginal Births to Women with "No Indicated Risk," United States, 1998–2001 Birth Cohorts

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## Abstract

**ABSTRACT: Background:** *The percentage of United States' births delivered by cesarean section has increased rapidly in recent years, even for women considered to be at low risk for a cesarean section. The purpose of this paper is to examine infant and neonatal mortality risks associated with primary cesarean section compared with vaginal delivery for singleton full-term (37–41 weeks' gestation) women with no indicated medical risks or complications. Methods:* *National linked birth and infant death data for the 1998–2001 birth cohorts (5,762,037 live births and 11,897 infant deaths) were analyzed to assess the risk of infant and neonatal mortality for women with no indicated risk by method of delivery and cause of death. Multivariable logistic regression was used to model neonatal survival probabilities as a function of delivery method,*

and sociodemographic and medical risk factors. **Results:** Neonatal mortality rates were higher among infants delivered by cesarean section (1.77 per 1,000 live births) than for those delivered vaginally (0.62). The magnitude of this difference was reduced only moderately on statistical adjustment for demographic and medical factors, and when deaths due to congenital malformations and events with Apgar scores less than 4 were excluded. The cesarean/vaginal mortality differential was widespread, and not confined to a few causes of death. **Conclusions:** Understanding the causes of these differentials is important, given the rapid growth in the number of primary cesareans without a reported medical indication. (*BIRTH* 33:3 September 2006)

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- Joseph E. Potter, PhD, Kristine Hopkins, PhD, Anibal Faúndes, MD, and Ignez Perpétuo, MD, PhD. (2008) Women's Autonomy and Scheduled Cesarean Sections in Brazil: A Cautionary Tale. *Birth* 35: 1, 33–40  
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- Susan R. Miesnik and Barbara J. Reale. (2007) A Review of Issues Surrounding Medically Elective Cesarean Delivery. *Journal of Obstetric, Gynecologic, & Neonatal Nursing* 36: 6, 605–615  
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- Christine Roberts, MBBS, FAFPHM, DrPH, Samantha Lain, BComm, BHLthSc, Ruth Hadfield, BSc, DPhil. (2007) Quality of Population Health Data Reporting by Mode of Delivery. *Birth* 34: 3, 274–275  
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- Joshua Z. Press, MD, Michael C. Klein, MD, Janusz Kaczorowski, PhD, Robert M. Liston, MBChB, and Peter von Dadelszen, MBChB, DPhil. (2007) Does Cesarean Section Reduce Postpartum Urinary Incontinence? A Systematic Review. *Birth* 34: 3, 228–237  
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